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THE

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A

MONTHLY JOURNAL

OF

DENTAL SCIENCE, ART, AND LITERATURE,

DEVOTED TO THE INTERESTS OF THE PROFESSION.

EDITED BY

W. H. DOLAMORE, L.R.C.P., M.R.C.S., L.D.S.

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THE DENTAL RECORD.

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Original Communications.

SOME OBSERVATIONS ON SUPPURATION IN THE ANTRUM OF HIGHMORE AND ITS VICINITY.

By J. Jackson Clarke, M.B.Lond., F.R.C.S.

Assistant Surgeon to the North-West London Hospital and to the City Orthopædic Hospital.

Before considering the morbid conditions of the antrum which more frequently present themselves to the dental surgeon, it may not be out of place to give a brief *résumé* of the anatomy of the part. Although the formation of the sinus begins about the fourth month of fœtal life, the space is still very small at birth, and it is not until the second dentition is completed that it reaches its full development. Sections of the upper maxillæ of children ranging from six to nine years show that the anterior or facial wall of the space is thick, and contains much cancellous bone. As the eruption of the permanent teeth is completed the walls of the sinus become thinner from the absorption of the inner layers of bone and consequent increase of size in the antrum. When the adult condition is attained there is a wide range of form and dimensions observable in comparing the antra of different, and even of the same, individual. The generally recognised type-form is the pyramid with the nasal surface as base, and facial, orbital and zygomatic surfaces to complete the tetrahedron. This pyramidal conformation is departed from most frequently by bulgings into the alveolar process of the upper maxilla. In what may be termed the normal condition, it is hardly necessary to say that the antrum comes into close relationship with the outer alveoli of the molar teeth. According to Zuckerkandl the most frequent departure from the average extent of the antrum is an extension from the lower and anterior limit of the space forward over the bicuspid teeth, the alveoli of which then project into the floor of the antrum. When the alveolar extension of the antrum is well marked, the cavity may easily be opened in the extraction of a tooth. A further extension of the cavity is now and then observed ; the cavity then extends into the palate, reaching in some instances, according to Zuckerkandl, to within a millimetre or two of the middle line.

Pathological Conditions.—The most important of these in relation to dental surgery is empyæma of the antrum, secondary to suppuration about the root of a tooth. When the case is rapid there is no difficulty in following the clinical course of events. As an instance of this class of cases the following case may be mentioned :—A man, aged 71, who had been attending my out-patient department at the North-West London Hospital for a Dupuytren's contraction of the fingers, associated with gout, returned, complaining of pain caused by inflammation about the carious stumps of the canine and bicuspid teeth of the right upper maxilla. I referred the patient to my colleague, Mr. C. F. Rilot, who extracted the stumps. The patient came back to me three days later and said that the pain had, if anything, increased. It was now of a neuralgic character, and was referred chiefly to the distribution of the infra-orbital nerve. There was at this time no swelling in the outer wall of the nasal fossa nor any other definite symptoms of antral abscess ; but suspecting the presence of pus in the antrum I advised the patient to come into the hospital, but this he declined to do. This delay probably cost the patient his life. A week later he reappeared. The pain had still further increased, and now there was some redness of the cheek and a distinct swelling in the middle meatus of the right nasal fossa, where the mucous membrane was bulged inwards and presented some flakes of pus. The patient now consented to come into hospital, and, matters being urgent, I had him prepared at once for operation. Under ether I perforated the antrum through the canine fossa and evacuated over an ounce of thick pus. The antrum was then gently irrigated and the patient was put to bed. The immediate result was a considerable relief to the pain, but the patient complained of headache, referred to the back of the right eye. This headache became somewhat suddenly worse on the fourth day after admission, the temperature went up to 103°, and slight proptosis of the right eye set in. The question of opening the right frontal sinus was now considered, but the deep-seated pain and the character of the proptosis—which was directed forwards without any downward deviation—pointed rather to infection of the ethmoidal cells. Whilst the grave operation of opening these cells through the frontal sinus was under consideration, the patient became unconscious and died with all the symptoms of meningitis. On making a post-mortem examination, it was found that the antrum was completely drained. The mucous membrane was detached from the bones forming the upper meatus and roof of the right nasal fossa. The right half of the cribiform plate was necrosed, and the dura mater covering it was sloughing. The ethmoidal cells were full of pus, and the anterior half of the right cerebral hemisphere was covered with pus. The case was clearly one of antral suppuration, secondary to caries of the teeth, and served to show what grave responsibilities may attach to such cases. Of course, primary antral empyæma may be complicated by toothache so that it may be difficult to tell which was the first event. In the case just related the mucous membrane of the antrum was thin, and not, as it is in cases of primary empyæma, thickened, polypous and studded with cystic dilatations of the glands. In the matter of diagnosis, electric illumination from the mouth is often of great utility.

There is one condition which may lead to or be mistaken for empyæma of the antrum. This is a large cyst around the root of a tooth. Such cysts are commonly due to chronic alveolar abscess, and are covered by a thin layer of bone formed from the periosteum which is raised up over the collection of pus. When the tooth is removed, pus escapes, often in suprising quantity, and it may be found that the abscess has extended into the antrum by thinning and perforation of the upper and posterior wall of the cyst.

Without going farther into the many morbid conditions which affect the antrum, it is hoped that these few scattered observations may serve to accentuate the importance of the early recognition and prompt treatment of abscess of the antrum.

Reports of Societies.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The Ordinary Monthly Meeting of the above Society was held on the 7th ultimo, Mr. R. H. Woodhouse, (President) in the chair.

The President, before calling on the Secretary to read the minutes of the previous meeting, referred to the sad loss that the

Society had sustained in the death of Sir Benjamin Ward Richardson. In his capacity as President he had attended the funeral ceremony on behalf of the Society, feeling it was his duty, and the least that could be done to the memory of so eminent and honourable a man. Dr. Richardson, as would be known, was an honorary member of the Odontological Society, and showed his interest in it to the last, his name being down for a communication to be read early in the new year. The Council had empowered the Secretaries and the President to write a suitable letter of condolence to Lady Richardson and the members of the family.

The minutes of the last meeting were then read and confirmed.

M. F. Lawson Dodd and Mr. Harold Dewe Mathews signed the obligation book, and were admitted members of the Society.

The Librarian (Mr. W. A. Maggs) stated that in addition to the usual exchanges he had received Mr. J. F. Colyer's book on "The Extraction of the Teeth."

The Curator (Mr. Storer Bennett) acknowledged the receipt from Mr. Horace Farebrother of a lower jaw, supposed to belong to an Anglo-Saxon, about 547 A.D., which had been dug up near Old Sarum. The arches were well developed and the teeth were well formed, without the slightest sign of caries. There was evidence of wear from mastication, and the wisdom teeth, which were unerupted, were somewhat misplaced. The specimen was an interesting one.

Mr. W. E. Harding (Shrewsbury), in a casual communication, mentioned a new antiseptic which he had been using for the treatment of dead roots and pulpless teeth. The drug in question was formalin, it was quite as powerful as corrosive sublimate, if not more so, and, unlike it, was not poisonous; though slightly volatile, it would not decompose. In a very diluted form it would destroy germs of anthrax and typhoid. In the treatment of root canals he used it in the proportion of 1 in 5. The gentleman who had brought it to his notice was a chemist who had devoted a good deal of attention to bacteriology, and he regarded it as one of the most potent germicides.

Mr. Storer Bennett wished to know whether by 1 in 5 Mr. Harding meant actually 20 per cent. formalin, or 1 in 5 of the substance which was sold by the chemist. Formalin, as sold, contained only 40 per cent. of the actual substance, and in that strength was very powerful. It was an escharotic, and would at once form a scar on the skin or mucous membrane with which it was brought into contact. He had used formalin for some seven or eight months, but only employed a weak solution, never using more than 4 per cent. of the original strength, and for pulps generally not more than 2 per cent. As a substancc for wiping over wounds that were unhealthy and sloughing, it was exceedingly good, but it should not be applied for any length of time; the wound should be simply swabbed over, and the patient's mouth washed out directly afterwards. It was also useful for hardening teeth for making microscopical sections. It had the remarkable property of sufficiently hardening tissues in 24 hours—such large tissues as the tissues of the eye—as to enable a section to be made through all the coats of the eye without displacing any of them. Tissues so hardened also did not contract. For those engaged in histological investigations formalin was one of the most valuable preparations that had lately been brought out. Like many other new chemical substances it was built up synthetically. He thought it very likely that after pulps were dressed with formalin they might be sufficiently hardened to be withdrawn in the way suggested many years ago, after they had been subjected to the use of strong tannin. Formalin also had the advantage that it did not injure their instruments.

Mr. APTHORPE said formalin had been brought to his notice by a friend, who used it as a mouth wash to give his patients in cases of spongy gums, employing a quarter per cent. solution.

Mr. HARDING, replying to Mr. Bennett, stated he used 1 in 5 of the ordinary formalin obtained from the chemist, that is, one of formalin to five of water. He did not use it in that strength for gum or soft tissue treatment, but merely as a germicide for dead roots.

Mr. H. LLOYD WILLIAMS asked Mr. Bennett what strength he used as a hardening solution for microscopic work.

Mr. STORER BENNETT replied that it was 4 per cent., viz., one-tenth of the 40 per cent. preparation supplied by chemists.

Mr. W. HERN, on behalf of Dr. Hogue, of Bournemouth, presented a set of teeth curiously covered with tartar. In a letter asking their acceptance, Dr. Hogue wrote :—"These teeth belonged to an old farmer in Scotland, and were removed from his mouth when on his death bed, and given to me by his brother. The teeth were made by the late Robert Hogue, of Edinburgh, my father."

A communication on "Electric Annealing of Gold," from Mr. Poinsott, was read by the Secretary.

Mr. J. H. REDMAN narrated an interesting case of retarded dentition. The patient, a young lady, was first seen by him six years previously, when aged 20. At that time none of the incisors had erupted, and only one canine, one bicuspid, and eight molars were present of the permanent dentition : these latter were very stunted and of miserable structure. Careful examination failing to discover the missing teeth, artificial substitutes were advised, and the molars, being very short, were capped with gold crowns to raise the bite, as the jaws were too close together. About six months after wearing the plate, a swelling appeared on the left side of the upper jaw, in the neighbourhood of the central incisor, but gave only slight discomfort ; it was lanced freely, and a miserably malformed tooth was disclosed. Everything went on well until six months ago, when the patient complained of severe neuralgia in both jaws, and a hard swelling had in the meantime appeared well up under the lip and the base of the nose. This, upon examination, proved to be one of the missing teeth. Mr. Redman lanced freely, and found it in such a position that it could never go into its proper place. He therefore removed it, and at the same time made a thorough examination of the lower jaw, when two incisors were found at an angle of about 45 degrees outside the medial line ; these were removed. He had no doubt that the pressure of the plates caused the effort to erupt, and by reflex irritation produced the neuralgia, but why it took nearly six years to induce the pain he could not explain. There seemed to be some history of retarded eruption in other members of the family. From what he could learn, the first dentition was perfectly normal. The neuralgia was completely cured by the treatment.

Mr. SIDNEY SPOKES asked Mr. Redman whether it occurred to him to call in the aid of the X rays to elucidate the case.

Mr. REDMAN replied that he had tried them, but having failed so badly did not refer to the subject in his communication.

Mr. F. J. BENNETT asked whether the temporary teeth were retained beyond their usual period ? When the permanent teeth failed to erupt the temporary had a more prolonged existence and there might be a connection between the one and the other.

Mr. HERN asked whether the patient had any taint of rickets.

Mr. REDMAN stated that he was informed by the mother the deciduous teeth came about the usual time and continued in the usual order. The patient was somewhat stunted in growth, but was very well developed, and there were no definite signs of rickets.

Mr. SIDNEY SPOKES, in a casual communication, said he could not but think there must be many instructive cases which few members had the opportunity of searching for themselves to be found in the museums of London alone which might be brought forward by the aid of lantern slides. The pictures which he showed upon the screen had been collected by him from different museums, and the various abnormalities presented were described.

Mr. J. F. COLYER then read a paper on "Open Bite." From a practical point of view Open Bite might be considered under two headings :—(1) Cases where the bicuspids and molars occlude, but the cutting edges of the upper and lower anterior teeth are separated from one another by a space more or less oval in shape. (2) Cases where not only the anterior teeth but the majority of posterior teeth fail to occlude. The former were invariably due to some acquired habit, such as thumb or finger sucking ; a by no means uncommon cause was to be found in the various forms of artificial teats given to troublesome children to pacify them. The etiology of those coming under the second head was frequently obscure. In a few instances the mischief might be traced to the use of regulation plates, the back teeth being left uncovered and so permitted to elongate. In many cases, more particularly the severe ones, the chief cause of trouble lay in some defective development of the ascending ramus. In a few instances the defect was an increased obliquity of the ramus, a point shown in one figure from Tomes's "Dental Surgery" (exhibited on screen), which also illustrated (Mr. Colyer said) another point in the anatomy of some examples of Open Bite, viz., the increase in the development of the anterior portion of the mandible. He was inclined to think in many cases the defective development of the ascending ramus was an actual arrest in growth, viz., a "shortening" ; such a condition would of itself produce an oblique angle. He had noticed in some cases the horizontal ramus of the mandible made a sharp bend downwards about where the most anterior fibres of the masseter muscle are inserted. Open Bite might occasionally be traced to arrest of development of the anterior portion of the maxilla, a condition also frequently associated with defective development of the ascending ramus. Honeycombed teeth might frequently be noted in cases of Open Bite, and he thought the condition was invariably accompanied by an arrest in development of the superior alveolar process. Speculating how far mouth breathing might contribute to a condition of Open Bite, Mr. Tomes was quoted as saying :—" Possibly the constant traction exercised upon the anterior part of the jaw in keeping the mouth open may have had some influence in determining the peculiarity of form ; and the freedom from the pressure exercised mutually by the antagonistic molar teeth upon each other may have led to their rising higher in their sockets than they do when their conformation is normal." But if this view were correct, Mr. Colyer saw no reason why the first molars and bicuspids should not rise as well as the second molars, but such was not the rule. In a paper on Open Bite, contributed to the Dental Record, Mr. Baldwin had recounted the views of Herr Schmidt, who found a strumous constitution usually associated with Open Bite ; a condition resulting in enlarged tonsils, and thickening of mucous membrane of both nose and fauces, which caused the mouth to be held open, the tongue to be held down to the floor of the mouth, and the tongue's tip to be pressed against the back of the front part of the lower jaw and teeth, in a downward and forward direction. This operation on the yielding bone of a strumous person had caused the alteration of the angle at which the body of the lower jaw was set to the ascending ramus, so that the deformity of Open Bite was produced. He also suggested that the impact of the column of inspired air upon the roof of the mouth was a cause of abnormal vaulting of the palate. Mr. Colyer said the explanation did not account for the bending of the mandible he had referred to, but might not the bending be produced by muscular effort ? The principal force of the muscles at the posterior part of the mandible was upwards, at the anterior part, downwards. The masseter ran as far forwards as the point where the facial artery crossed the bone, and it was near this point one noticed the marked bending. Thus the mouth was of necessity kept open, and was therefore constantly being acted upon by the depression of the jaw, while the muscles at the back of the jaw, viz., the temporal, masseter, and internal pterygoid, were constantly tending to raise the mandible. The idea, he owned, was purely speculative. In support of the view that a vaulted palate is in some measure due to pressure of inspired air, Mr. Colyer quoted a paper bearing on the point, in a recent issue of the *West London Medical Journal*, by Mr. Mayo Collier ; a paper worthy of careful study as opening up new thoughts and shedding fresh light on some forms of contracted arch. As to treatment, in the first class of cases, found in children, much might be done by breaking any vicious habits that had been acquired, and, during this period, a skull and chin cap might be used ; but if the habit had been continued during the eruption of the second dentition, the treatment was of little avail. Where the personal appearance was of great importance, for example, in young girls, the crowning of the six upper anterior teeth might be called for. In a very severe case, this might not be practicable, and in such circumstances the removal of the anterior teeth and the insertion of a continuous gum denture would be the best course to adopt. In the second class of cases, the treatment might be considered under the following heads :—(1) Removal of adenoids and enlarged tonsils. (2) The use of the skull and chin cap. (3) The removal of teeth. (4) Cutting in the bite. (5) A combination of the above. The removal of adenoids and enlarged tonsils would be desirable in order to prevent nasal obstruction, one of the causes of Open Bite, and, moreover, such removal always benefited the general health and nutrition of the patient. The skull and chin cap was strongly recommended by some, and might, in a few cases, be quite sufficient to bring the teeth into proper occlusion, but if the method were to succeed, the apparatus must be constantly worn, and properly adapted, care being taken that pressure was exerted in an upward, and not a backward direction. Mr. Colyer regarded this form of treatment only suitable for cases arising from some mal-arrangement of the teeth, and not suitable to cases of defective development of the ascending ramus or angle. He thought it rather a weak reed to rely upon entirely, but it was a useful adjunct to other forms of treatment. The majority of cases would be greatly benefited by the removal of the second molars, and some quite remedied by this course ; but, in instances of sound second molars, extraction was hardly justifiable if other methods could be resorted to. Where the second molars were sound, and the first molars unsavable, the best course to be pursued was to remove the remains of the first molars, and employ a skull and chin cap, following it up by "cutting in the bite." When the deformity was very severe, it might be necessary to resort to the extraction of a large number of teeth, as in the case recorded by Mr. H. Rose, in the *Journal of the British Dental Association*, for November, 1896, where the whole of the teeth were removed and dentures substituted with beneficial results. The method of "cutting in the bite" was extremely satisfactory, and might be used alone, or in combination with extraction or the skull and chin cap. The treatment consisted in grinding down the teeth until the bicuspids and the molars articulated. The method possessed the advantage of being permanent, and giving the patient a good surface for mastication, as well as avoiding a long and tedious line of treatment, necessitated when a tendency for the teeth to rise again exhibited itself directly the apparatus was thrown aside. The operation should extend over several sittings, and a fairly long period of time. The advantage of a good space of time between each sitting was that any irritability of the pulp, caused by the operation, could subside, and time was allowed for the probable formation of secondary dentine, so that more tooth structure could be removed than would be the case if a shorter period were allowed. The cut surfaces of the teeth should be polished after each sitting, and the patient directed to apply some spirits of wine to them twice a day. The necessity of first drying the surfaces of the teeth and keeping them free from saliva for about a minute after the spirit had been applied should also be impressed upon the patient. In his last two cases Mr. Colyer had used nitrate of silver instead of spirits of wine, but, though more effective, it had the disadvantage of discoloring the teeth. A combination of methods frequently succeeded where any single line of treatment failed. Illustrations of cases suitable were thrown upon the screen, and in such instances, Mr. Colyer usually first extracted the first permanent molars, then used a skull and chin cap for a period of, perhaps, six or twelve months, while the second permanent molars were moving forward into the gap caused by the removal of the first permanent molars, at the same time expanding the arch, if needful. Further, he "cut down the bite" if the skull and chin cap was not sufficient to bring the jaws together.

Mr. CURNOCK cited a case, recently under his care, of a boy 12 or 13 years of age, in whom only the posterior portion of the second molars articulated. The first permanent molars were badly decayed, and he at once extracted them. He did not then grind down the cusps, but waited to see what would happen. A year later the second permanent molars had come well forward, and the Open Bite was perfectly cured. Before using the skull or chin cap, or grinding down the cusps, he thought it would be advisable to wait a little, as he had done. He was also firmly convinced of the wisdom of thinking twice before extracting the first permanent molars. He was well aware of the controversy that existed as to their removal in cases of crowded mouths, but he thought, when heedlessly extracted, disastrous results often followed.

Mr. H. G. READ stated he had had two cases recently, in which the bicuspids and molars on one side had failed to articulate. In one case, the first molars were absent, and there was a wide space between the second upper and lower bicuspids and second molars, the third molars and the first bicuspids only articulating. Crowning the molars and bicuspids in one jaw he found impossible, owing to there being too much space, so he had to crown both the upper and lower. He brought the crowns up so as to cover the space due to the extraction of the two first molars. The other case was very similar. He now had under treatment the case of a young lady who applied to him some five years ago for treatment of "open bite." He tried the skull and chin cap, but could not get her to wear it night and day. When she returned, some time after, her mouth was in a bad state, necessitating the removal of two or three of the molars. The extreme cusps to the upper second molar and lower second molar, were the only teeth in contact. He ground the cusps down, and made an articulating plate, which she wore with very fair comfort.

Mr. REDMAN said he had amongst his patients, four sisters with Open Bite, the ages of the patients varying from 18 to 23, two of them being twins. All had enlarged tonsils, and were mouth breathers, to which he entirely attributed the deformity. He had treated the eldest by crowning the anterior teeth, and probably would do the same with the others. No doubt, as Mr. Colyer had suggested, by "cutting in the bite," and crowning, he would be able to make good mouths.

Mr. STORER BENNETT thought the anatomical slide shown, seemed to point to a little weakness in Mr. Colyer's argument. Mr. Colyer stated, that, as a rule, the bending of the lower jaw took place at the anterior margin of the masseter muscle. He (Mr. Bennett) thought, if the members took themselves as anatomical specimens, and traced their fingers along the anterior borders of the masseter muscle they would find that the anterior border was always considerably forward of the place indicated in the anatomical specimen. Mr. Colyer had also stated that the drawing up of the back part of the masseter muscles, and the drawing down of the anterior part by the muscles that were employed in opening the jaws would induce an upward growth of the lower jaw. If that were the case, they would expect to get a symmetrical bending down of the jaw, but, as was seen, the Open Bite extended as far back as the front of the second molar in the lower jaw, to the canine on the other side. He did not for a moment state that Mr. Colyer's explanation was not correct, but only that the slide did not support his argument.

Mr. MAIN NICOL considered there was another cause of Open Bite which Mr. Colyer did not touch upon. In most cases, the obstruction to occlusion was caused only by the antagonism of the second molar, but the second molar, as Mr. Colyer had pointed out, seemed to be situated on a sort of rising up of the jaw. It appeared to him that in such examples they had a crowding of the jaw, in which, not the anterior, but the posterior teeth suffered, and so the second molar erupted in a position very similar to that of a wisdom tooth, it was higher up than the rest of the teeth, and its biting surface was forwards as well as upwards. In these cases, the extraction of the first molars would allow the tooth to come into its normal position.

Mr. ROBBINS, alluding to the case mentioned by Mr. Curnock, said if it was got perfectly right without grinding down the cusps of the teeth, was it due to a considerable tilting forward of the second permanent molars? If so, he should be inclined to cut down the bite somewhat, and apply nitrate of silver.

Mr. CURNOCK said the teeth had certainly come forward very considerably, but there was not that amount of tilting often seen when the first permanent molars had been taken out. The articulation of the second permanent molars was not perfect, but of the bicuspids and incisors it was good.

Mr. W. A. Maggs said, with regard to Mr. Colyer's ingenious suggestion as to Open Bite being due to muscular action, he believed there was something in it. It was not only the masseter muscle which acted on the ramus, but the temporal and internal pterygoid also tended to pull that portion of the mandible upwards.

Mr. Baldwin, with respect to the term Open Bite, wished to give credit where it was due; although he believed he was the first to import it, Herr Schmidt was its originator.

Mr. Geo. Cunningham concurred with Mr. Storer Bennett's remarks. The specimen shown on the screen was a wood engraving, and the position of the notch might be the fault of the engraver. While discussing the problem with regard to the bone itself, would it not be well to have some regard to the problem of the forces compounded by the numerous teeth, their cusps and relations, and so on. That was one of the really complex points with which dentists had to deal, and was the foundation of all scientific irregularities. The cases he had treated had been very few, and had been treated entirely by the cutting down process.

Mr. G. Whittaker (Manchester) thought one of the causes of Open Bite had been overlooked, namely, the decay of the temporary teeth, patients having tender temporary teeth were afraid to bring them close together, as a consequence the first permanent molar rose up in its socket, and became much longer. When the decayed teeth were removed, patients were enabled to bite on the sound teeth, and, consequently, the offending teeth were driven down more firmly into their sockets. As an instance, he mentioned a case the opposite of Open Bite, namely, a close bite, in which the lower incisors impinged behind the central incisors in the upper jaw.

Mr. J. F. Colyer, in reply, said he did not base his views on the drawing he had shown. The view he held with regard to the muscular action was arrived at from cases which had come under his notice at the Hospital. It was quite by chance, in looking through Mr. Tomes's book, that he came upon the drawing which seemed to illustrate his point. He had constantly noticed in cases of Open Bite, that curious bending down about the region where the masseter muscle was inserted. He did not think Mr. Storer Bennett's remarks had in any way lessened the weight of his argument, because it was not at all necessary that the bending should take place immediately in front of the anterior fibres of the masseter muscle; it was simply a question of relative force acting in an upward direction on the ascending ramus. In reply to Mr. Curnock he did not adopt the treatment of cutting in the bite until he had tried the extraction of the first permanent molars, and the use of the skull and chin cap, but he rarely found these methods quite sufficient. With regard to Mr. Redman's remark, there could be little doubt that large tonsils and mouth breathing had something to do with Open Bite, but at the same time, a very large number of people with nasal obstruction had not got Open Bite. Nasal obstruction might be part of the cause, but he hardly thought it the sole cause.

The PRESIDENT announced that the next meeting would take place on the 11th of January, and the usual votes of thanks concluded the meeting.

DENTAL STUDENTS' SOCIETY, DENTAL HOSPITAL OF LONDON.

AN Ordinary General Meeting was held on Monday, December 14th, the PRESIDENT (Mr. J. F. Colyer) in the chair.

THE CURATOR AND LIBRARIAN (Mr. J. C. Douglas) announced that ten new volumes had been added to the library, each being the gift of its respective author. He considered that they were a very valuable addition to the library, and hoped that members would take advantage of their presence. He also acknowledged a model, showing the mechanism of the poisonous fang of a venomous snake, the work of Mr. Barnard.

On Casual Communications being called for—

Mr. PAYNE showed and presented to the Society a model of the lower jaw of a patient 21 years of age; the right lower temporary canine, he said, was fairly firm, but the permanent canine and lateral were completely transposed. The permanent canine had not erupted till patient was 16 years old. The temporary canine was extracted to relieve crowding and was found to be very much absorbed.

Mr. WILLIAMS presented to the Society a two-rooted lower bicuspid.

Mr. O'CONNOR recorded the case of a tertiary syphilitic lesion which occurred in a tooth-socket a fortnight after the extraction of the tooth. The case was under the care of Mr. Storer Bennett.

The PRESIDENT then gave a lantern demonstration, illustrating a few cases in the treatment of Open Bite and of crowded mouths.

Several gentlemen took part in the discussion which followed—

The PRESIDENT then announced that the Annual Meeting of the Society would take place on Monday, January 18th, when Mr. Woodhouse would read a paper on "Rest."

The following is a short account of the demonstrations given at the Clinical Evening, held on Friday, November 30th.

Mr. W. J. MAY made nine glass inlays with the aid of the Downie furnace. He said care should be taken to see that the cavity is not undercut. Thin platinum foil is burnished into this cavity to get an impression. This is gently removed, filled with Downie body (or pink enamel if at the gum margin), and fused in the furnace; two fusings generally being necessary. The platinum is stripped off and the inlay fixed with cement, after slightly undercutting the cavity.

In shallow cavities it is a good plan to place a few grains of sand in the bottom of the platinum impression before filling with body, as this leaves a rough surface for the better adhesion of the cement.

Mr. NORMAN BENNETT demonstrated the use of thin steel matrices in connection with plastic fillings. He pointed out that the most essential quality of any matrix was the capacity of close application to the middle of the cervical edge, as it was this part which, in a contour filling, it was impossible to trim after insertion. He demonstrated the manner of cutting the steel to the correct shape and retaining it in position by means of amadou wedged between the tooth to be filled and the adjoining tooth, the free edge of the matrix being steadied by the forefinger of the left hand during insertion. In this way he filled an upper bicuspid with amalgam, and also an upper incisor with osteo, putting permanent guttapercha at the cervical edge, which was below the gum margin. He considered a matrix particularly useful in such cases, and, indeed, in all teeth with deep cervical edges.

Mr. GABELL gave a demonstration with solila gold, filling an interstitial cavity in an upper bicuspid. The cavity was prepared in the usual manner to receive gold, with very little undercut and no retaining pits or grooves. The gold was cut up in pieces about the size of the floor of the cavity and annealed in a sheet of mica, and then placed in the cavity and carefully condensed with the smaller pluggers. No. 1 gold was used throughout. Mr. Gabell said that the gold required very careful use and to be thoroughly condensed, and that unless small pluggers were used bad edges were sure to result; the rocking movement with the special pluggers was certainly the best way of condensing and very useful in packing the gold against the walls, so as to insure the always necessary concave surface of gold while filling.

Mr. JOSEPH showed a method of constructing all gold crowns in the mouth. The root was prepared in the ordinary manner, care being taken to give it a decided cone shape. It was then measured with binding wire, and a 22-carat gold band cut the required length and soldered with No. 1 gold solder. The band was then fitted to the root, the top also being cut down to allow for the articulation with the opposing cusps. A 20-carat gold cap was then struck up with Mellotte's crown dies, and the edges trimmed off close to the cusps. The whole was fitted accurately to the top of the band to which it was next *tacked*. The crown was then placed on the root and the bite closed forcibly. In doing this the soft gold yielded, and accommodated itself to the articulation. The inside of the cusps were boraxed, and No. 3 solder allowed to flow into them. The completed crown was then trimmed up and polished.

Mr. HAY also showed an interesting case of superior protrusion, at present under the care of Mr. H. Lloyd Williams, and Dr. Miller some excellent microscopical specimens.

MR. T. JACKSON, Junr., L.D.S., Edinburgh, has been appointed Dental Surgeon, with salary, to the Burnley Union Workhouse and Infirmary.

IT is satisfactory to learn that after a year's work in the Nottingham Union Schools the Dental Surgeon has so justified his appointment that the Committee decided to report to the Board the success of the experiment and of the permanent benefit to the children.

THE DENTAL RECORD, LONDON: JAN. 1, 1897.

THE MEETING OF THE MEDICAL COUNCIL.

It is a matter for satisfaction that the Report to the Medical Council of the Inspector of the various Dental Examinations held in the United Kingdom should have been of so favourable a nature. In the opinion of many, we fancy, the inspector was expected to disclose all sorts of delinquincies in the examinations at different Colleges. Such false ideas may now be safely laid aside, for in the opinion of the Committee of the Medical Council: "All the Examining Bodies in essential matters now follow out the curriculum and fairly well maintain the standard of the examination." This is really a matter for congratulation, since, after all, the power of the Council is, in most cases, limited to recommending rather than enforcing. This was clearly brought out in the discussion which followed the presentation of the Report, even though the subject of discussion centred rather round the idea of checking the too progressive than as to ways and means of urging on those who should prove too lax. It seems that within certain limits each College is at liberty to work out its own curriculum, and this is really most desirable, for the Medical Council is slow to move, and not, in the absence of a dental representative, well qualified to do so. At the same time it is a little difficult to see how if one College is at liberty to leave out one course of lectures, say, of Materia Medica, the Council can logically interfere should another College exclude some other course, say, Mechanical Dentistry. Indeed, in a little kingdom, as this Britain of ours, it would not be a superhuman task to arrange an uniform standard both of study and of examinations, even though these latter be held at different centres. This, however, is a matter touching the whole question of medical education; but is brought forward somewhat by the suggestion of the Committee that the examinations at Glasgow and Edinburgh might well be combined. Discussion on this point was, however, adjourned, as was that on the question of the Irish Board continuing to issue its diplomas to sine curriculo students. This action has been the subject of a good deal of just criticism, and certainly it does appear to depreciate the value of dental diplomas as a whole, seeing that an average member of the public is not likely to inquire as to the conditions of the issue of a diploma, nor, indeed, as to which is the issuing College. At the same time it must not be forgotten that by insisting on a certain line of conduct in its diplomates, the Irish Board has endeavoured to raise the tone of professional life, and that in many ways it would be an advantage if every non-qualified registered dentist were an L.D.S.I.

As a profession we are certainly indebted to the Inspector of the Dental Examinations. The work of criticism is not altogether a pleasant task, and in this case must have needed the expenditure of a considerable amount of time and trouble. Moreover, however just Sir Dyce Duckworth may have been in his reference to the expenditure of several hundred pounds, none of this has found its way into the pockets of the Dental Inspector, who has laboured purely "con amore."

News and Notes.

THE following has been forwarded to us by the Dean of the Dental Hospital Hospital of London :—"The members of our profession who so liberally subscribed towards the fund raised to build a new hospital will be interested to know that the plans for the building have been accepted, that Messrs. Young and Hall are to be the architects, and that as soon as the site can be cleared the building will be commenced. The plans can be seen in the Council Room of the Odontological Society by anybody who may wish to see them. The site of the new hospital is to be on a large area on the south side of the square, next to the present hospital, and is bounded on the north by Leicester Square, on the south by Long's Court, on the east by Green Street, and on the west by St. Martin's Street. It is intended that the new hospital shall be ready for occupation in eighteen months. When the Committee purchased this site they did so relying upon the rents the houses would produce during a few years, to enable them to accumulate money for building. Recently the houses have been condemned as unsafe and unsanitary, and are now being demolished, consequently the authorities are compelled to begin building; this must necessarily involve the charity in considerable indebtedness, towards defraying which help is most seriously asked. The new hospital will be a structural alteration that will greatly improve the appearance and sanitation of that part of London. It is possible therefore to appeal for funds for three reasons: (1) The usefulness of the charity; (2) The Committee has to build before it is prepared to do so, because the houses have to be pulled down; (3) The building of the hospital will in every respect improve a part of London which much needed it, and has enabled the parish to improve the Green Street corner, which was one of the most dangerous in London. The Committee of Management will be most grateful for any pecuniary help; perhaps some members of our profession may be able to influence others to bestow their charity upon our deserving institution."

GENERAL MEDICAL COUNCIL AND THE DENTAL LICENSING BODIES.

The General Medical Council devoted nearly the whole of its final sitting, on Tuesday, December 1st, to a consideration of the qualifying examinations conducted by the following Dental Licensing bodies, viz., The Royal College of Surgeons of England, the Royal College of Surgeons of Edinburgh, the Faculty of Physicians and Surgeons of Glasgow, and the Royal College of Surgeons in Ireland. Two years ago the Council appointed Mr. Charles S. Tomes, M.A. F.R.S., to inspect these examinations, and this he did, and thereafter presented a separate report upon each to the Dental Education and Examination Committee. In accordance with the practice of the Council, in the case of medical qualifying examinations, and with the Act of Parliament, the report of Mr. Tomes was sent for remarks to the body inspected, and with these remarks and Mr. Tomes' report before them, the Dental Education and Examination

Committee drew up a report upon each examination for presentation to the Council. It was upon these four reports that the discussion took place.

Mr. BRYANT, who represents at the Council the Royal College of Surgeons of England, and is Chairman of the Dental Education and Examination Committee, introduced the subject in a short speech. He explained that this was the first time the Council had before them reports on the examinations of the dental licensing bodies, and invited the Council to be very careful in their consideration of them. If members looked through the reports critically he thought they would find that upon the whole the curriculum required by this Council had been fairly followed, and that where deviations had occurred, they were either on the same lines as those adopted or suggested by the Council or possibly a little in advance of them.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The Council dealt first with the examination of this body. Mr. Tomes in his report set forth that after the passing of the Dentists Act, 1878, and the registration of dentists already in practice, the Faculty admitted to examination *sine curriculo* those who had obtained registration, and under these regulations some hundred diplomas were conferred. He was informed, however, by the Secretary that many of the *sine curriculo* candidates had passed through a modified curriculum. This privilege of registration was withdrawn in 1888 (it was extended in a few cases to 1890) and since that time all students had been obliged to conform to the published regulations of the Faculty ; *cum curriculo* about 73 had obtained the diploma, though out of the total of 173 only 113 names appeared upon the *Dentists' Register*. Some of course had died, some had never been registered, and some had their names removed. In their report the Dental Education and Examination Committee summarised both Mr. Tomes' report and the remarks of the Faculty upon it, so that perhaps the best thing is to quote it, as giving an adequate presentation of the whole case. It said, "The inspector reports that this examination is sufficient, and, in many respects, an excellent one; but he considers the pass-standard to be a little below that of other examinations with which he is familar. He regards this as a necessary consequence of the system of marking. The marks in one case were apparently adjusted so as to enable a candidate to pass. He considers it desirable to examine candidates under numbers rather than under their names, and that each examiner should hand in his marks to the secretary, and not place them on the general marking sheet. He suggests that no examiner should have access to the marks obtained by a candidate in any other part of the examination. He condemns the system of division of subjects in the final examination, but sees no objection to such an arrangement in the first examination. He recommends that a practical examination be held in Dental Mechanics, and that the period of attendance upon General Hospital practice be increased from six to twelve months. In reply, the Council of the Faculty criticises the report of the inspector for making comparisions and entering into subjects which it thinks would better have been omitted. At the same time the Council of the Faculty accepts the suggestions of the inspector, and states that twelve months' attendance on hospital practice is now made compulsory (1896); that a practical examination in Dental Mechanics will come into operation as soon as the necessary arrangements can be made; and that the Council promises to revert to their system of marking, which was in vogue till eighteen months ago, and so fall in with the recommendations of the inspector to tabulate the marks at the end of the examination. The Council approve the inspector's comments on the undesirability of examinatiom in instalments, and will suggest to the examiners the desirability of altering this arrangement. It is convinced that for an inspector to do the work single-handed is neither fair to himself nor the examination reported on."

Dr. Hector Cameron, the representative of the Faculty on the Council, said he wished to make a few observations on this subject. Personally he did not think it a wise thing that assessors in assessing the value of the oral examination should have before them the numerical value that had been appended to the written examination, but they must remember that after all a certain number given as a judgment upon an examination was only an approximate judgment. The fact that the judgment was expressed in terms of an exact science unfortunately did not make the judgment itself exact. Two equally competent examiners might listen to the same answers, and might come numerically to very different conclusions, whereas, if they had the opportunity of discussing matters, they might find themselves to be very much more nearly in agreement. For his own part he thought it was fairly arguable, whether, if a student did remarkably well in a *viva voce* examination, and was only a very little below the mark in a written examination, a complementary number might not occasionally be given to allow him to pass on the whole. It would appear that in one case the inspector got seriously confused. He had to follow the candidate from table to table, and he had apparently mixed up the various subjects. As to other matters in the report they were being attended to, and the Council might rely on their wishes being loyally carried out by the Faculty.

Dr. McVAIL (Glasgow) said the report of the Dental Education and Examination Committee was a mere abstract, and suggested that the Committee were frightened to say anything about this examination.

Mr. BRYANT explained that this was only one of a series of reports on individual bodies. The Committee had also prepared a report upon the examinations as a whole, where, undoubtedly, comments would be found. He should be prepared, however, in this case to add to the report an expression of opinion by the Committee that they were pleased to find the examination a sufficient one.

With this addition the report was adopted by the Council.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

The Report of the Committee on the examination of this body was as follows:—"The inspector points out that this examination for the License in Dental Surgery was instituted after the passing of the Dentists Act, in 1878, and that the first examination was held in January, 1879. Since then 201 candidates out of 232 examined have obtained their diplomas, and 84 of them were *sine curriculo*. Since 1889 no examination has been granted to candidates *sine curriculo*. At the present time 144 names appear upon the *Dentist's Register* as holding the Edinburgh Diploma, and of these 14, or 9·7 per cent., are registered as possessing full medical or surgical degrees. Candidates are practically examined under their own names, although numbers are assigned to each; and in each part of the examination the examiners work in pairs. Fifty per cent. are pass marks. Candidates are not admitted to the oral examination in any subject if they fail to obtain 40 per cent. marks for their written. The inspector reports the examination as sufficient and in many respects a very good one. He sees no advantage in the system of percentage marking as employed, as each subject and each section of the examination standing alone favours the weak candidate and hampers the examiners in proportioning the marks to the merits of the candidates. He would rather have every candidate pass or fail upon the total aggregate of his marks, without regard to separate subjects or to separate parts of his examination, provided that there be a minimum mark on each subject. He thinks more time and more marks should be devoted to the practical examination, and that candidates should be tested in their knowledge of Dental if not General Histology. The president and council of the Royal College of Surgeons, Edinburgh, express their satisfaction on the generally favourable terms of the report of the inspector, and have had his suggestion carefully considered. They regard their scheme of examination as sufficient and satisfactory for a pass and not a competitive examination, and are neither in favour of his suggestions as to the method of marking, nor as to the necessity of giving more time and marks to the practical part of the examination. They are, however, pleased to give every consideration to suggestions for the improvement of the examinations."

Mr. BRYANT, in moving the adoption of the report, said he would be quite prepared to add an expression of opinion that the Committee were pleased to find the examination satisfactory and sufficient. The requirements of the College, he added, were quite up to those of the Council.

Several members of the Council complained that insufficient time had been allowed for the consideration and discussion of the reports, and suggested that nothing more should be done with them during the present session.

Sir DYCE DUCKWORTH said that this was the most important work the Council had in hand at the present moment. It had cost hundreds of pounds, and an enormous amount of labour, and it was of the utmost importance that each report as it came up should be seriously considered by the Council. Unless this were done, the whole thing would be a perfect farce.

Dr. P. HERON WATSON (Edinburgh) said he believed his College would be perfectly satisfied with the amount of care bestowed upon its examination. He thought it had every reason to be satisfied with the observations made. He regarded them as singularly destitute of any important objection, and containing a number of pious opinions which no doubt would be estimated at their proper value.

The report was then adopted by the Council.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

Mr. BRYANT next submitted the report with regard to the examination of this body, which was to this effect, viz :—" This Examination was instituted in 1878, after the passing of the Dentists Act, and up the end of 1895 504 candidates had been passed out of a total of 629 examined ; whereas the *Register* showed that there were 447 Licentiates of the Irish College of Surgeons at that time in practice, and that only four of those hold additional medical or surgical qualifications. The *Register* also shows that of the 504 diplomas granted, only 14 were passed *cum curriculo ;* aud at the present time any person already on the *Dentists' Register*, on production of certificates of respectability, of having been five years in practice, and of not having advertised during the past two years, may be admitted to examination. Ten such persons applied in June, 1896, when the examination was visited. The inspector reports that the first professional examination was sufficient and quite satisfactory in all respects ; it is, however, only applicable to the *cum curriculo* candidates. In the second examination the practical part was taken first, as candidates who fall short in this are not admitted to the papers or the oral examination. The examination was pronounced sufficient. The inspector would, however, have liked to have seen the Practical Mechanical Examination extended, and the Oral associated with it omitted as a distinct examination, but made part of the Practical. As the *sine curriculo* candidate is exempt from the first Professional Examination, and when passed is indistinguishable from the *cum curriculo* so far as privileges are concerned, the inspector thinks it is a matter of serious consideration whether, if the *sine curriculo* candidate is to be admitted for any longer period, he should be granted a diploma upon terms so much easier than the *cum curriculo* candidate—more especially as the inspector expresses doubt as to the adequacy of the examination to which the *sine curriculo* candidate is subjected. The inspector also in this, as his other reports, finds fault with the system of percentage marking in its practical application in the making of candidates pass each subject separately, the examiner hesitating to give a weak candidate the low marks he may deserve for fear of these marks then and there rejecting him in his subject. He believes it is better to let the candidate pass by a total aggregate of marks, so that excellence in one direction—and particularly in the practical—may cover slight deficiency elsewhere. He would, however, retain the power of an examiner to reject a candidate upon any one subject or part of a subject. His suggestion is therefore that the candidate (unless rejected summarily upon any part) should pass or fail upon the total aggregate of his marks, retaining, however, the feature—which appears to be a good one—that a deficiency of marks in the practical portions of the examination cannot be made up elsewhere. The Council of the Royal College of Surgeons of Dublin, in their remarks upon the report of the inspector, dispute some of his criticisms, and assert that it has all along been the aim of the College to make the mechanical test very thorough. They admit that the examination work crowded into one day had better be divided, and have now made arrangements to that effect. The Council believe that they are exercising a wise policy in still admitting *sine curriculo* candidates to examination, as by so doing they have gained a control over about a tenth part of the legitimate dentists of the United Kingdom, and so advanced dentistry towards becoming a reputable profession. They consider the arguments in favour of continuing this policy far outweigh those for abandoning it. They agree with the inspector that additional weight should be given to the practical portion of the examination, and have agreed to modify the final Dental Examination with that object. The Dental Education and Examinatiou Committee cannot fail to see that the Royal College of Surgeons of Ireland, by still admitting *sine curriculo* candidates to examination, and exempting them from the First Examination, have done their best to neutralise the effect of the Dentists Act of 1878, and to drive dental students to obtain a license elsewhere. Indeed, since that date only 14 candidates have passed *cum curriculo*, whilst 490 have passed *sine curriculo*, and so long as the College continues the system it is hardly likely *cum curriculo* candidates will apply in any number."

Sir William Turner, seconded by Mr. Teale, moved that the consideration of this report, the report on the examination of the

Royal College of Surgeons of England, and the report on the examinations as a whole, be postponed until the May Meeting and taken up then at an early period of the meeting.

Dr. P. Heron Watson said he would have no objection to this if he received an assurance from the representative of the Royal College of Surgeons of England that the proposed changes in the regulations of that body would not be put in force until this Council had had an opportunity of considering them.

Mr. Bryant, in reply to this, said that the new regulations had passed the Council and would come into force on the 1st January, 1897. His College were prepared to show all deference to the General Medical Council, but they did not feel that they were bound to ask it or any other body what they were to do in a matter of this kind. As representing the College of Surgeons, he repudiated altogether the idea of this Council interfering, unless the College showed very strong indications of going against the principles laid down by this Council, and he could show very easily that the new regulations were entirely consistent with these principles.

The motion for postponement, being put to the Council, was adopted.

The Council's Requirements for Dental Examinations.

Professor MacAlister (Cambridge) said it appeared to him that the Dental Education and Examination Committee would do well if they asked the Council's instruction to revise the existing requirements with regard to dental examinations. If it turned out that they were inadequate and advance was desirable in the way indicated by the Royal College of Surgeons, then he was sure the Council would take action. It was certainly most desirable that the various licensing bodies should advance side by side, and not that one body should take the lead and shake off the responsibility of this Council. He would suggest that the Committee take up the requirements again with a view to recasting, if necessary, and improving them so as to bring them into line with the latest advance of science and experience.

Dr. P. Heron Watson, on the suggestion of Sir William Turner, read to the Council Section 22 of the Dentists Act. of 1878, which says: "Every medical authority shall from time to time, when required by the General Council, furnish such Council with such information as such Council may require as to the course of study and examinations to be gone through, in order to obtain such certificates as are in this Act mentioned, and generally as to the requisites for obtaining such certificates, and any member or members of the General Council, or any person or persons deputed for this purpose by such Council or by any Branch Council, may attend and be present at any such examinations." With this in the Act he contended that his case was stronger than ever, and he would therefore earnestly desire either that Mr. Bryant agree that no further action be taken in the matter of the new regulations until this Council had considered this very important constitutional question, or that he (Dr. Watson) be allowed to proceed with his motion on the subject and take the opinion of the Council.

Several members pleaded the urgency and importance of this matter, and Dr. Heron Watson was allowed to proceed with his motion.

Dr. HERON WATSON moved:—"(1) That the letter from the Secretary of the Royal College of Surgeons of Edinburgh, addressed to the President of the General Medical Council, be received and placed upon the Minutes.

"(2) That in view of the action of the Royal College of Surgeons of England in the matter of altering the scheme of education and examination of that college for their dental diploma without previous communication with this Council, together with the statement contained in a footnote on page 5 of a Report of the Dental Education and Examination Committee to the General Medical Council signed by Thomas Bryant (Chairman), of date November 1896: 'that the College of Surgeons of England has never admitted that its regulations required the sanction of the General Medical Council, this Council do now instruct the registrar that he shall in each year apply in writing to each of the bodies granting dental diplomas or certificates, requiring it to furnish to the Council before its May meeting, in accordance with the provisions of section 22 of the Dental Act, 1878, such details of its existing regulations under which it grants a diploma or certificate to practise dentistry or dental surgery as shall enable this Council to determine how far these regulations conform to the existing requirements of the Council." There was no desire, he said, on the part of the Royal College of Surgeons of Edinburgh to say anything disrespectful of its sister college. The great object it had in view was to obtain the opinion of this Council upon a constitutional question as to the right of a body sending a representative to this Council to proceed to make changes in its scheme of education, and more especially such changes as were suggested in connection with these new arrangements of the dental curriculum of the Royal College of Surgeons of England, without having in the first place submitted them to this Council for an opinion as to whether they regarded them as in accordance with the requirements of the Council. He would now read the letter which had been sent to the President of the Council by the secretary of the Royal College of Surgeons of Edinburgh. It was as follows viz.:—

"Sir,— I am directed by the President of the Royal College of Surgeons of Edinburgh and his Council to apply to you for information regarding the course of study and the examinations required by the General Medical Council for the dental diploma. In the regulations thereto passed by the General Medical Council on March 25, 1879, the following courses, among others, were required :— (1) A second course, during a winter session, of anatomy ; or, alternatively, a course of not less than twenty lectures on the anatomy of the head and neck. (2) A course of chemistry, six months. (3) A course of practical chemistry. (4) A course of materia medica. (5) Twelve months' attendance at a general hospital with clinical instruction. From the 'Report of the Education Committee on the codification of the existing regulations of the General Medical Council applicable to dental qualifications, in 1894, it would appear that these regulations are regarded as being in force ; and that registration as a dental student must precede the course of professional study laid down by the Council, in 'the same manner as the existing regulations for medical students.' The Royal College of Surgeons of Edinburgh has accordingly required candidates for its dental diploma to conform to the regulations of the General Medical Council. It appears, however, from the 'new regulations relating to the diploma in dental surgery,' issued by the Royal College of Surgeons of England, July 9, 1896, that there are the following departures from the regulations of the General Medical Council :—(1) The second course of anatomy is not required, nor is any equivalent course such as that of anatomical demonstrations, as enjoined by the Edinburgh college, required. (2) Attendance on a course of materia medica is not required

(3) In the attendance prescribed at a general hospital, attendance in only surgery and clinical surgery is required. (4) In the synopsis of the subjects of examination, appended to the regulations of the English college, that of medicine is altogether omitted. The President of the Royal College of Surgeons of Edinburgh and his Council are therefore desirous of being informed whether these changes, made by the Royal College of Surgeons of England in the regulations for its dental diploma, have been made with the cognisance of the General Medical Council, or have been sanctioned by it. Several other changes, such as the terms of attendance on chemistry and practical chemistry, might also warrant enquiry, but the matters specified above are those which the Royal College of Surgeons of Edinburgh regards as more immediately requiring explanation.

Mr. BRYANT said that by way of answer to this he would read a report drawn up by the Dental Education and Examination Committee, which was to this effect :—" The changes in the curriculum of the Royal College of Surgeons of England for their qualifying examination in dentistry, passed in July, 1896, could not have been laid before the General Medical Council prior to the opening of the present session, and therefore could not have received the sanction of the Council at the date of the letter of inquiry ; but, as they in no sense deviate from the principles the Council have laid down for such examinations, there seems to be no reason why they should be objected to by the Council on account of differences in matters of detail. The committee believe that the General Medical Council have no wish to bring all examinations into exact and literal uniformity. Liberty must be allowed to the different corporations and examining bodies to carry out their curricula and examinations in the way which seems best to their governing authorities ; and so long as these examining bodies follow the main lines which the General Medical Council have formulated, the details of their courses of study or examinations may vary within certain limits without drawing down upon them the displeasure of the Council ; indeed an examining body may at times act in advance of the Council, to the advantage alike of the students they examine and the cause of medical education. With respect to the new regulations for the dental diploma of the Royal College of Surgeons of England, dated July, 1896, it may be said at once that the changes which have thereby been introduced in no way lose sight of the objects the General Medical Council had in view when they formulated their curriculum in 1879, when the Dentists Act first came into force, although they may differ in detail. It is true that the English college does not require a second full or alternative course of anatomy as orginally advised by the Council, and in this respect the college appears to be acting in harmony with the other dental examining bodies. The college at one time required two courses of anatomy, but ceased to do so in 1889. The college also requires, besides a full winter course of anatomical lectures, twelve months' dissections, spread over two winter sessions—these courses including anatomical demonstrations ; the college in this matter acting like the other bodies. It is true the English college does not require attendance either upon a three months' course of materia medica or upon the medical practice of a general hospital, and medicine has never been a subject of the examinations, the college giving as a reason that it objects to load the curriculum for a dental surgical diploma with these subjects, when other important branches of knowledge more nearly touching dental practice are called for. The college, however, now as formerly requires attendance upon a course of lectures in medicine, and another in surgery with attendance at a general hospital for two winter sessions upon surgical practice and instruction in clinical surgery. The English college moreover requires, in addition, the attendance of the student on special practical courses of dental histology, dental surgery, metallurgy, and mechanical dentistry, on the ground that those branches of practical subjects are important in dental work. It should be added that the certified instruction in chemistry, as well as in practical chemistry, is that afforded at institutions recognised by the college, and that such instruction may have been received before the student enters for his preliminary science examination, which includes chemistry, physics, and practical chemistry, and which may be passed before entering at a dental school ; these requirements for dental being identical with those for medical students. These arrangements of the English college do not appear to call for any adverse remarks from the Dental Education and Examination Committee. They come from a college which has had vast experience, and are worthy of the careful consideration of the other Dental Licensing Bodies."

Mr. Bryant said that although he was chairman of the Committee and his name appeared at the end of the report, and he at the same time occupied the position of representative of the Royal College of Surgeons of England, he believed there was no partisan feeling about the report, and that it gave a fair and proper view of the case. On hehalf of his college, he insisted that there had been no lack of courtesy to the Council. Not admitting that it was under any necessity to ask permission from this Council to alter its curriculum in the way it thought best, it had formed its own conclusions and made its alterations, always, of course, having the requirements of this Council before it, and these alterations were handed to the Council at the earliest possible moment.

Mr. Brudenell Carter, one of the members of the Dental Education and Examination Committee, said it was not for this Council to lay down a hard and fast line of rigid uniformity with regard to matters of this kind. A certain freedom, liberty and elasticity were essential to vitality, and if they endeavoured to crystallise and compress the regulations of all the bodies into the same pattern, they should lose in vitality far more than they were likely to gain in any other respect. He saw not the slightest objection to Dr. Heron Watson's motion, and he was not going to oppose it; he saw no objection to getting the regulations of the licensing bodies, but he saw very great objection in an attempt to bring all these bodies under a cast iron rule.

Sir William Turner, seconding Mr. Heron Watson's motion, said there could be no objection to receiving the letter and entering it on the minutes, while as to the second part of the motion it was only asking the Council to carry out the 22nd section of the Dentists Act.

Sir Dyce Duckworth suggested that instead of the word "requirements" of the Conncil, they should substitute "recommendations." It must never be forgotten that in matters of this kind the Council could only suggest or recommend; it had no power to enforce.

After further discussion the first part of the motion was passed as proposed, and the second part in this form: "That this Council do now instruct the Registrar that he shall in each year apply in writing to each of the bodies granting dental diplomas or certificates, requiring it to furnish to the Council, before its May Meeting, in accordance with the provisions of section 22, of the Dentists Act, of 1878, such details of its existing regulations, under which it grants a diploma or certificate to practise dentistry and dental surgery, as shall enable the Council to determine how far these regulations conform to the existing recommendations of the Council."

On the motion of Professor MacAlister, seconded by Mr. Brudenell Carter, a remit was made to the Dental Education and Examination Committee, to consider whether it was desirable in any way to modify the existing requirements of the Council.

Mr. Merrill's Application for Registration.

The Council received further communications with reference to the application of Mr. Alfred Perkin Merrill, Melbourne, for registration as a dentist in the United Kingdom. One of these was a letter from the Privy Council (to whom Mr. Merrill appealed against the decision of this Council not to place his name on the *Dentists' Register*) enclosing copies of affidavits in support of the application received from Mr. Merrill's legal representative in Melbourne, and requesting this Council to favour the Privy Council with any further observations it might have to make on the case. On the motion of Sir William Turner it was decided to ask Mr. Muir Mackenzie, the legal adviser of the Council, to prepare a reply to the Privy Council in the same sense as previous replies.

THE DENTAL HOSPITAL OF LONDON.

The Annual Dinner of the Past and Present Students was held, on the 5th ult., at the Hôtel Métropole. Mr. Robert H. Woodhouse presided, and had the support of a more than usually large company, numbering over 170.

The Chairman, in proposing the toast of the evening, "The Past and Present Students," said the toast, as its name implied, was a very comprehensive one, including, as it did, the new students under the friendly ægis of the demonstrators; secondly, the diplomats fresh from the College of Surgeons; thirdly, those busy throughout the country, and lastly, those who had retired and were in the enjoyment of a well-earned competence. His own student days were spent in Soho Square. That hospital was the first opened in Great Britain, viz., on 1st November, 1858, and was the outcome of the deliberations of the Odontological Society. His acquaintance with that hospital, and subsequently with the hospital in Leicester Square, had brought him into contact with a great number of dental students, and associated with them had been some of the greatest pleasures of his life. Opportunities were afforded from time to time of renewing old acquaintanceships, and the men he met seemed to be very flourishing, and hardly to be recognized from the raw material of the old days. Those who recollected the Dental Hospital in Soho Square would recognise a very different order of things now. In those days there was much competition for a front chair in order to get a little light, a privilege accorded to the students who arrived first, and they might be seen on a dark winter's morning sitting on the railings outside waiting for the doors to open. The requirements of the dental surgery were now much greater than formerly, there was then but one dental engine, jealously guarded by the house surgeon, and only permitted to be used by the senior students, and each student had to bring his own burs. Their hospital had been like the banyan tree, which, extending its branches outwards, takes fresh root, and so spreads out, causing new growths; there was scarcely a dental hospital, they might almost say a general hospital, which had not some scion of the old hospital of Soho Square. After the hospital was removed to Leicester Square in 1884 a very great advance was made, and they hoped very shortly to make a much greater advance; there was one difficulty, viz., a financial one, but that, he trusted, would be overcome. If the rich and benevolent could but see the afferent stream of sorrow and the efferent stream of joy that daily passed the doors of the hospital, they would not be slow in coming forward with the sum of money required. The matters now under the consideration of their able trustees were rapidly maturing, and he thought there was a prospect of the past and present students of the hospital looking upon the building with greater admiration than they did their present Alma Mater. The gentlemen whose names were associated with the toast were Mr. J. Howard Mummery, a former distinguished student and present Examiner at the Royal College of Surgeons, and Mr. R. L. Young, a present distinguished student.

Mr. J. HOWARD MUMMERY, in responding, said, Like many present, his memory went back to Soho Square. The hopital had passed through the larvæ stage, and from that out of a "grubby" condition into one very much larger; but it had not yet room to spread its butterfly wings. He was rather critical about the term "past" student, and would ask were any of them past students? The present student took in his knowledge like the barn door fowl his food—the greatest amount in the smallest time, but he doubted if the former had the assimilating powers of the latter.

Mr. R. L. YOUNG replied on behalf of the present students.

Mr. HENRY MORRIS proposed "The Hospital and School." In searching for a reason why he had been entrusted with the honour of proposing the toast, he came to the conclusion that it was intended as a graceful compliment delivered through one of the senior members of the staff to the Middlesex Hospital, and this led him to inquire in how many ways and through how many individuals this connection had been made. First, he thought of Sir John Tomes, who nearly 60 years ago was made dental surgeon to Middlesex Hospital, and in 1845 lectured in the schoolroom of the hospital; it was then he impressed upon the students that surgery had received a great boon from the introduction of anæsthesia, and pointed out the five different stages of narcotism produced by ether. He also gave them two cardinal rules—First, that no patient should be allowed to be anæthetised until four or five hours after a meal; and, secondly, that extreme silence during and after the administration of anæthesia should be preserved. Following Sir John Tomes there came the gentleman who was associated with him in getting passed the Act of 1878, and who had rendered so many services to the dental profession, he referred to Mr. James Smith Turner. He saw also many other connecting links between the two hospitals present, but regretted that the close association of early days existed no longer, doubtless due to the fact of the near proximity of Charing Cross Hospital. During the 26 years that he had lectured at Middlesex, he always found that amongst the most industrious, the most intelligent, the most courteous, were the dental students.

Mr. STORER BENNETT, replying on behalf of the School, said it was one of the pleasures of responding to the toast that it was always so enthusiastically received by the students. When they recollected how many hospitals had sprung up in all parts of the kingdom, he thought they could view the work of the Dental Hospital in bygone years with honest pride and congratulation. He regretted to have to announce that they had lost two of their lecturers. While they would no longer have the genial presence of Mr. David Hepburn, as lecturer on Dental Mechanics, he was happy to say they would have in his place one equally enthusiastic, namely, Mr. E. Lloyd Williams. They also had to regret the loss of Mr. Arthur Underwood ; but if anything would console them it was the appointment in his stead of one so eminent as Mr. Charles Tomes.

Mr. J. SMITH TURNER, in replying for the Hospital, dealt with the subject of the proposed new building, and referred at the outset to their indebtedness to Sir Edwin Saunders's liberality. The Managing Committee had endeavoured to maintain the same position as far as possible, and they had been charged by some with extravagance in consequence, but in answer to those who complained of the expensiveness of the site he would say there were many necessities which could not be overlooked. Their chairs were their beds. A general hospital could arrange its beds in many ways, while they could only arrange their chairs in one way. The Managing Committee desired that it should not be a philanthropic hospital only, but also a teaching hospital, and that the general public might know that they were not only relieving suffering but helping to teach. They had to obtain a good light and be in a central position. Their patients could not be accomodated night and day, but must go and come each day, for these reasons it was essential they should remain in their present position. Mr. Smith Turner alluded to the services rendered by Dr. Walker in overcoming immense difficulties—difficulties which he believed no other man in the profession could have overcome. He was glad to say they were rapidly disappearing, and he hoped it would not be long before they had a satisfactory building fitted out in a satisfactory way for the teaching of dental students, for the amelioration of pain, and for the carrying out of the daily work of their lives.

Mr. E. LLOYD WILLIAMS proposed "The Visitors," to which Mr. A. J. WOODHOUSE responded.

Mr. S. J. HUTCHINSON proposed "The Health of the Chairman," who briefly replied.

The musical arrangements, under the direction of Mr. Schartau, were exceptionally good, and Mr. Fred Russell's "ventriloquacity" sparkled with original humour. Altogether the dinner was one of the most enjoyable even of the dinners of the Dental Hospital of London.

Abstracts and Selections.

SALIVARY CALCULI.

By Gustav Fütterer, M.D.

A few months ago I extracted two calculi from a submaxillary gland, and, as such calculi are very rare occurrences, I thought it well to report the case; Professor Christian Fenger then favoured me by putting at my disposal a calculus which he had removed from Wharton's duct, and Dr. W. P. Verity kindly gave me another, which he had taken away either from a sublingual gland or from one of its ducts.

Case I.: *Submaxillary Calculi.*—Mr. M., thirty-four years of age, about four years ago, while eating, noticed the appearance of a swelling under the jaw, on the left side. A moment's pressure of his finger on the swelling caused it to disappear. This occurred several times. Three years ago this spring he noticed a similar swelling, which, however, became enlarged and painful; pressing had no effect. A physician was called, who prescribed poultices and leeches, and after a week the swelling gradually disappeared. After about six months the same trouble came again, but this time it did not yield to treatment as readily as before. After about another six months it again made its appearance and was more stubborn than ever. Altogether the patient had suffered from such attacks four or five times when he called upon me.

I found him a tall, slender, somewhat anæmic man, with a "weak" stomach and an enlarged gall-bladder—he had suffered from several attacks of gall stone colic; he complained of pains in the left submaxillary region and some difficulty in swallowing. The left submaxillary region was swollen; there was a swelling on the floor of the mouth, along Wharton's duct; and on pressure of the submaxillary gland, pus of a greenish colour escaped from the orifice of Wharton's duct on the left side. A calculus could not be felt, but the frequent attacks on the same side, in the course of years, together with the fact that the patient had never suffered from tonsillitis, pharyngitis, or stomatitis, suggested the idea that a calculus might be the cause of the trouble.

I then called in Dr. John S. Marshall for surgical aid. Dr. Marshall passed a small silver probe into the duct and discerned, at a depth of seven centimetres from the cutting edge of the inferior central incisor tooth, a hard body, which led to the belief that a calculus was present in the gland. He then cut open the upper third of the duct, and introduced an especially prepared slippery-elm tent, intending to remove the tent after a lapse of twenty-eight hours and look for a calculus.

In the course of the next night the swelling and the pains increased considerably, involving the left side of the face and neck, and the whole tongue, compelling me to remove the tent after it had been in position for twenty-four hours. The removal of the tent was followed by a gush of about an ounce and a half of saliva and greenish pus. On passing a probe, we felt a calculus deep down in the gland. Dr. Marshall then passed a grooved director down to the calculus, and with a curved bistoury laid open the duct throughout its entire length. The incision measured about two centimetres at the surface of the floor of the mouth, but probably not more than one centimetre at the level of the calculus. This, however, did not enable him to take hold of the calculus and extract it. My own attempts in the same direction also failed, and we therefore packed the incision to further dilate the duct and make another attempt the following day. The next morning, after removing the packing and washing the gland thoroughly with a five per cent. solution of carbolic acid and then with peroxide of hydrogen, through a rubber catheter, I succeeded in removing a small faceted calculus of a yellowish colour, weighing one grain. On the same evening I removed another calculus, also of a yellowish colour, weighing twenty-four grains. A thorough probing of the cavity convinced me that no more calculi were present, but for greater certainty I introduced a urethral electroscope, and, as the bed of the concretions was in the upper posterior portion of the gland, I had no difficulty in submitting the parts to ocular inspection. If the thought of using the electroscope had suggested itself to me sooner, I could have easily ascertained the size, shape, and position of the calculi, and this would have facilitated their extraction materially.

During the following two weeks the cavity was cleaned twice a day, and after each cleaning the duct was loosely packed with gauze to prevent foreign bodies from entering. Later on, when the duct grew smaller, a silver tube was introduced and allowed to remain. Twice this tube was changed for a smaller one, and now the patient wears one that has about the diameter of a normal duct. All those tubes I fastened to the incisor teeth with silver wire.

Chemical Examination.—Dr. J. A. Wesener, who made the chemical examination, reports as follows: "Specific gravity, 1584. It is composed of calcium, sodium, and potassium acid phosphate, with a trace of xanthine and iron. Tests for ptyalin, potassium sulphocyanide, fats, fatty acids, carbon dioxide, magnesium, and inorganic acids, negative."

The microscopical exmamination (Fütterer) gave no particular results.

Case II.: *Calculus from Wharton's Duct.*—The following history was kindly given me by Professor Christian Fenger, who observed the case:

Mrs. X., fifty years of age, on partaking of sour food, would occasionally notice a little lump arising in the right submaxillary region, accompanied with some pain. In half an hour the lump would disappear, and would not return for two or three months. So it ran along for years. The patient never had any sore throat or stomatitis until about two months before operation, which was performed on the 21st of January, 1895. The lump, however, had been continuously present for some time, the submaxillary swelling tender, and the throat and right half of the floor of the mouth sore. Swallowing was painful all the time, and she had been gargling with listerine since the latter part of November to cure what she considered to be a sore throat. Sometimes, when she sat down to a meal, the lump would assert itself very suddenly, with a kind of dull pain, which would continue for fifteen or twenty minutes, sometimes an hour, or even on rare occasions an hour and a half. Then the swelling would disappear spontaneously. She never noticed that any fluid came into her mouth, or that she had to spit; the swelling simply disappeared. When the swelling was present there would be a sensation of pain and distress in swallowing.

Under anæsthesia the duct was opened for three-quarters of an inch, and with forceps a stone was removed from behind and below the posterior border of the mylo-hyoid muscle. The cavity was about two centimetres long and one centimetre wide. The duct was found dilated. The cut portion was united by sutures, and healed almost entirely by first intention. After healing, a probe was passed freely from an opening close to the papilla to the posterior part of the duct, where an opening into the mouth remained, through which saliva or clear mucoin fluid could be squeezed up by pressure on the gland. Ten days after the first operation, Professor Fenger, without an anæsthetic, closed this opening by sutures; after three weeks it was closed permanently.

An examination, made April 18, 1896, showed that the patient had remained perfectly well: sublingual and submaxillary glands normal, also Wharton's duct; no opening at posterior border of mylo-hyoid muscle; a probe could be passed through a small opening two millimetres outside of the papilla for a distance of two to three centimetres; duct not dilated.

Chemical Examination.—Specific gravity, 2306. Stone composed of calcium, sodium and potassium acid phosphate, with a trace of iron and uric acid.

Case III.: *Calculus from a Duct of the Sublingual Gland.*—Dr. W. P. Verity gives me the particulars of a remarkable case. His patient was a woman, aged forty. At the age of twelve she began to feel a swelling at the left side of the floor of the mouth, which would come and go, and which interfered with mastication, but not with swallowing; twenty-eight years later the swelling had increased so that it lifted up the tongue and pressed it over to the right side. Interference with mastication increased, but there was no difficulty in swallowing. A calculus could be felt about one and a half inches from the caruncula salivalis. Dr. Verity cut into the mass; pus was evacuated, and with it a calculus.

The calculus was of cylindrical shape, the ends rounded off, flattened on one side of its longest diameter so that a cross-section would show a plano-convex shape; surface warty, colour grayish-white, and consistency hard.

Avenzoar, who lived in the thirteenth and fourteenth centuries, seems to have been the first to recognize the presence of salivary calculi "under the tongue." The earlist cases of which I have read the account in the original were reported by Lister* in 1672, and by Bonavert* in 1698.

Lister reports: "After a severe cold a patient noticed a hard lump in his mouth. This was due to a calculus, and about eight years passed between its breeding and its being taken away." As to its growth and the inconveniences thence ensuing, he further says, "Upon all fresh cold-taking, he suffered much pain in that part, and yet, that cold being once over, the part was no more painful than the rest of the mouth." Lastly, as to the particulars remarkable at the time of its being taken away, he relates: "It began its work with a sudden vertigo, which lasted from spring till August, in which month, without any previous cause, save riding, the place where it was lodged suddenly swelled and emitted purulent matter at the aperture of the Whartonian duct. Then it suddenly stopped its running, and swelled with great inflammation, and very great danger of choking, causing great pain when endeavouring to swallow anything liquid. Incision; removal of a whitish calculus, which weighed seven grains."

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* Philosophical Transactions, London.

Bonavert relates his case as follows: "Thomas Wood, of Wrotham, was so troubled with a quinsy that he could hardly swallow any liquid. I found the tumour tend to suppuration inwardly, about the root of the tongue on the right side, though it was almost as large as an egg outwardly, but without any sign of suppuration there. I ordered him maturating gargles, and the next day sent my man and bid him advise him to endeavour to break it with his finger, which the man effected and brought out of his mouth near the quantity of a quarter of a pint of matter, and with it, at last, the calculus. He had likewise a ranula, and before he had broken the tumour and spit out the corruption he could hardly speak. I believe this stone to be of the same nature as those generated in the kidneys and bladder. The weight of this stone in air is seven grains, and its specific weight, compared with water, is near $1\frac{91}{103}$ to 1."

Immisch, in 1861, opposed the opinions of English physicians, that there was a practical relation between the origin of salivary calculi and gout. His own opinion was as follows: "Inflammations of the salivary ducts are frequent occurrences, and if such inflammations become chronic they may cause small elevations and indentations which will narrow the lumen of the duct, thereby causing a retention of saliva. Saliva will be retained in folds and pockets, and crusts form, to which mucous and pus are added. This crust leaves open the centre portion of the duct, and so the canal is formed which has been found in salivary calculi. In the interior of the gland the calculus is formed in the same manner, but there the calculus has no central canal."

Mareau accepts three causes: first, foreign bodies which have accidentally entered the duct; second, tartar (hypothesis of Richet;) third, inflammatory strictures.

Let us see what material literature gives us for reasoning in this direction.

De Closmadeux (1855) says that in two cases foreign bodies had been found.

S. Michel (1867) describes the formation of a calculus in a duct of the sublingual gland, after this duct had been pierced through by a fish-bone, the latter forming the nucleus of the calculus.

J. W. Hulke (1872) found a dark central speck, which proved to be a fragment of wood.

Roche (1894) saw shot as a nucleus, in a musician who used to clean his instrument with shot; it had been aspirated, pressed into the caruncula salivalis, and by way of the duct had entered the gland.

Rayer found a foreign body the size of a gooseberry-seed as a nucleus.

Roberts (1869) saw a man fifty-four years of age who, twenty years before, had eaten some mustard and got a small mustard-seed under the tongue, which caused him violent pain for some days. The pain finally subsided, but the patient felt a small lump there ever after. This lump under the tongue would swell and pain him whenever he took cold, but the trouble would disappear with the cold. Dr. Roberts removed a calculus, and in its centre found a cavity "very much the size and shape of a mustard-seed," but he found no mustard-seed.

In the foregoing six cases foreign bodies were ascertained beyond a doubt as a nuclei of the calculi, while in one case it seems certain that a mustard-seed had been there but had disappeared.

Kochling (1835), who published a case of calculus, thought it necessary to mention that the teeth of his patient were covered with thick layers of tartar, and Mareau and Richet also call attention to tartar as a probable cause.

Wyatt Pratt (1871) had a patient who had once shown symptoms of tuberculosis of the lungs, and had coughed up from the bronchial tubes some calcareous concretions, while later came a number of calculi from Wharton's duct.

Gross foreign bodies which enter the mouth with the food, or in a more accidental manner, can become the cause and the nuclei of salivary calculi. This has been found true in a comparatively small number of cases. Extraneous materials present in the oral cavity, breaking loose and entering the ducts, can cause the same effects. I refer to fragments of decayed teeth, and especially tartar. The fact that chemical analysis revealed in my own case xanthine, a derivative of uric acid, and in Professor Fenger's case uric acid, points to tartar as a cause, as tartar sometimes contains uric acid. Dr. J. A. Wesener, who has analyzed the tartar of one hundred teeth, found uric acid in eight of his specimens.* Small pieces of tartar often break down, and can very easily enter the ducts, especially Wharton's duct, and here we find the most calculi, which are very rare occurrences indeed in Steno's duct. Gravitation will bring the pieces down to the bottom of the mouth rather than up to Steno's duct; they will also remain there longer, and occasion to enter will offer itself more readily. The lower incisors are places of predilection for the formation of layers of tartar, which here project as plates over the margin of the gums and easily break down.

Bacteria, especially leptothrix buccalis, may give rise to the formation of a calculus. Bacteria have so far, according to my knowledge, not been found in salivary calculi, and I have not found them in my cases, but that is of little importance if we remember that a mustard-seed could have disappeared, and that tubercle bacilli seemingly disappear in old fibrous and calcified tubercles, and if we further consider the length of time needed for the formation of a stone.

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* *International Dental Journal*, April, 1896.

A certain disposition for calcareous depositions is indicated by the case of calculus of Wharton's duct of Wyatt Pratt, in which calcareous concretions were coughed up, and also by my own case, in which the patient had an enlarged gall-bladder and had suffered from occasional attacks of gall-stone colic.

I have reviewed forty-five cases of calculus in the duct of the submaxillary gland, nine cases from the submaxillary gland, four cases of calculi which seem to have occurred in the sublingual gland, and four in its ducts. So the calculi are chiefly found in Wharton's duct, while they are very rare in the submaxillary gland and in the sublingual gland and its ducts. I may add that only a few cases of calculi have been found and reported in the parotis and Steno's duct in man, while a great many have been reported in animals. If to our number of cases, sixty-seven, we add the ninety-three reports which we did not have at our disposal, the number of salivary calculi reported would sum up one hundred and sixty; and bearing in mind that these are the cases reported from the thirteenth century up to date, we must come to the conclusion that salivary calculus in human beings is a rare occurrence, even if we grant that there may have been cases in which the nature of the trouble was not recognized, and other cases which have never been published. Concretions were found in only three cases by Virchow, Closmadeux, and Malenfant, and they all occurred in Wharton's duct.

Men are affected about ten times as frequently as women.

The earliest age at which the symptoms have appeared was twelve years, and twice we find the age of seventy reported as the time of operation and relief; but from the twentieth to the fortieth year is the preferred time of life.

One calculus was found in fifty-five cases, ten calculi in one case, and a great many in one case.

The symptoms of calculi of the submaxillary gland and its duct may be classified as follows:

1.—*Symptoms of the Initial Stage.*—Only in one case was this stage well marked by severe pains, caused by the entering of a mustard seed (Roberts), which then caused the formation of a calculus.

2.—*Symptoms of the Stage of Formation of a Stone and of its Growth.*—This stage may be passed through without any noticeable symptoms arising. Bruce reports a case in which a calculus existed for fourteen years without causing much inconvenience. Most patients on eating, especially if the diet be especially tempting (Elston), will suddenly notice a swelling in the submaxillary region, which according to its degree may be more or less painful. On resting the mouth and pressing on the swelling the latter will disappear. Such swellings will also come and go with colds (Lister, Roberts). They appear in the submaxillary region, are of a hard consistency, and are also to be seen and felt at the floor of the mouth between jaw and tongue, pressing the latter upwards and somewhat to the other side. In one of Hulke's cases the swelling seemed to be so firmly grown on to the hyoid bone that it was taken to be a fibroid. If a calculus is lodged in Wharton's duct, it can often be felt by the patient or physician. Alston's patient complained of being unable to eat, of feeling a weight, and of having a rock in her mouth, while a patient of Freudenberg had noticed a calculus which projected and could be seen close behind the right caruncula salivalis. The voice also may be affected. Clark, in speaking of a patient, says: "His voice, which had been harsh and coarse, after removal of the stone became flexible and resonant." Severe attacks of toothache, caused by the presence of a calculus, have also been observed at this stage, and Lister reports vertigo lasting from spring until August. Elston says, "The sympathy existing between the nerves of smell and taste was in my case most beautifully illustrated, for, according to the patient's accounts, he could never pass a savory smell without feeling a sudden enlargement of the submaxillary gland and pain, and he said he had dined but a few days previous to my seeing him on a meal which always used to make his mouth water, but which, in this instance, in consequence of the outlet of the duct being completely closed, had produced so violent a distention of the gland as to at once set up such a degree of active inflammation as shortly after led to the discovery of the nature of the disease."

3. *Symptoms of the Stage of Suppuration.*—Suppuration prepares for the expulsion of the stone, which in many cases is brought about by way of the duct or by way of a fistula, of which I find three cases reported, in one of which Nélaton extracted a calculus through the fistula. Such a suppuration may come suddenly, causing considerable swelling of the gland and the surrounding parts, great difficulty in swallowing and in mastication, impaired speech (Bonavert), facial pains (Rouyer), attacks of suffocation (Lister, Jessup), and in Oliver's case the opening of the mouth was prevented by the painful swelling. In short, this stage brings quite a variety of symptoms and a great deal of suffering to the patient, who soon seeks relief.

The stage of suppuration may, however, come and go several times, or it may become extremely chronic, as in Terrier's case, where chronic swelling and discharge of pus lasted for a long time.

Symptoms of Calculi in the Sublingual Gland and its Ducts.—Immisch (1891) considered the formation of calculi in the sublingual ducts improbable. Michel (1867) reported a case, which I have already mentioned, in which a fish-bone had pierced a sublingual duct, and then a stone had formed. And I think all doubts are removed by Dr. Verity's case, in which there was no difficulty in swallowing but great difficulty in mastication, much swelling in the mouth but very little to be seen in the submaxillary region, and while there may have been some slight compression of Wharton's duct, the stone could not have been lodged there, but must have been in the sublingual gland or one of its ducts; judging from the shape of the stone, and from the fact that it could be felt, I should say it was in a duct. As by far the most calculi are found in the ducts, the symptoms, together with the results of palpation and careful probing, will throw light on the case ; the probing becomes especially useful if a calculus is located in the gland where it cannot be felt by palpation.

Modes of Procedure for removing Calculi.—Bonavert (1698) sent his man to the patient, and bade him tell him to try and break it (the tumor) with his finger, "which the man effected." J. W. Hulke (1872) made his way to an abscess cavity in the submaxillary gland from the outside, tying the facial artery. All other operators have opened the abscess wherever they found it, or proceeded by way of the duct, cutting it open. Fenger anæsthetized his patient, cut the duct, and sewed it up again, while Marshall cut the duct and then dilated its lower portion with a slippery-elm tent.

In our sixty-seven cases, five single relapses occurred, while in another case three relapses were reported as occurring in the course of twenty years. In one of those cases the calculus is said to have grown within a year, but I would rather believe it had already been present when the other calculus was removed. Calculi had very probably been left in in some of the other cases also, and it seems as if real relapses were very rare, so that we may consider the prognosis to be good if at the time of operation all calculi present are removed. Other bad consequences, such as stenosis, &c., I have not found recorded.

The calculi reported measure up to six centimetres in length and five and one-half centimetres in width, and they have been found to weigh up to eighteen grammes (two hundred and seventy grains.)

Their form is more or less cylindrical, oval or round, or more spindle-shaped. The surface has been found smooth, but usually it is somewhat uneven, very finely granulated or warty.

The colour is generally a grayish-white or yellowish-white, but it may also be brownish.

Their consistency is either hard or fragile.

The cut surface is generally lamellated, and Virchow, on examining microscopical cuts, found regular formations of homogenous lamella and granular portions of yellowish-green colour. In my own case the large calculus is only lamellated in its peripheral portions, while the central part shows an irregular configuration. This stone is from the gland itself, while the two others in the original cases reported were from the ducts and lamellated throughout.

The specific gravity differs very much.

Chemical examination always shows the presence of phosphate of lime, and sometimes carbonate of lime. Malenfant made a quantitative analysis, finding :—

	Per Cent.
Phosphate of lime	27
Phosphate of magnesium	1
Basic phosphate of lime	60
Mucin insoluble in water, alcohol, and muriatic acid...	4
Ptyalin	2
Loss	6
	100

—*International Dental Journal.*

Reprinted from *Medicine.*

CONCERNING VULCANITE.

By Dr. C. A. Allen, Buffalo, N. Y.

The physical changes which vulcanite undergoes during the process of its becoming a solid body, I think, are little understood. At any rate, the remedy for many of the evils of unscientific treatment is too rarely employed.

To begin with, let us briefly consider the elementary character of this body. The gum as it comes to the manufacturer is purely a vegetable compound—a hydrocarbon—made up of $H_{16}C_7$ (however, upon these proportions authorities differ, but not to the injury of our argument).

Sulphide of mercury, which renders the body of use in our art, is now added in the proportions of one to two of rubber. We now have a compound which, when properly treated, produces a uniformly dense and sufficiently strong base for our purposes.

Some of our high attenuationist friends of "little pill" fame, boldly declare red vulcanite plates to be the origin of all obscure physiological derangements, charging as they do that the coloring pigment is red oxid of mercury, which is highly irritating to mucous tissue. The absurdity of this charge is clearly manifest when it is stated, as a matter of fact, that our colouring pigment is simply sulphide of mercury. This preparation possesses no toxic or even disturbing physiological effects whatever, and may be brought into mucous contact with impunity.

Experimentation by thorough processes, aided by the most delicate instruments, has demonstrated that the quantity of mercury which it is possible to evaporate from a vulcanite plate, before actually destroying the body itself, is only infinitesimally small. It should be remembered that in order to have even this slight manifestation of the "enemy's" presence a high degree of heat must be attained, a condition which could not be sanely looked for in the human mouth.

In the process of vulcanization it is readily conceded that we first have fusion of the component parts of the body under treatment, which occurs at certain definite temperatures.

What are these points of fusion ?

Any work on chemistry will place you right on the melting point of the sulphur in the mercury compound—and that will be 237° + F. As to the melting point of the hydrocarbon compound (rubber), elaborate experiments by Dr. A. P. Southwick prove, beyond the possibility of controversy, that this will be at 248° F.

Now, with the component parts of our body all fused, we may naturally expect the commencement of that remarkable and little understood physical change in the compound which *we* term vulcanization. That this change does begin at once upon the fusion of the compound's ingredients, and that vulcanization as we understand it may be fully completed without the addition of a single increment of heat, is easily demonstrated. All that possibly could be required in addition to the present conditions would be a continuation of the 248° to 250° F. over a longer period of time. If doubt exists in the mind of any one present as to the truth of this statement, let me suggest to him that he can easily obtain a "lazy man's proof" of it by asking any manufacturer of rubber garments how he treats the articles as to temperature, time, etc.

Continuing in my quotations of the authority mentioned, I fearlessly make the statement that the actual destruction of vulcanite begins at 300° F. and continues in proportion as the temperature is raised to 600° F., where rubber will be entirely dissipated, the sulphur being affected in the same manner at 824° F.

Now a word in regard to vulcanizers and their use. It should always be borne in mind that the degree of heat indicated by the mercury bath thermometer *never* registers the degree of heat corresponding to that of the inside of the vulcanizing pot where the case is being treated. The figures for this statement are as follows: If the stratum of atmosphere inclosed in the pot above the water-line (when the cap is adjusted) is not expelled upon a degree of heat sufficient to generate steam being reached, we can always confidently rely upon our thermometer registering from 15° to 18° F.—according to the amount of water—below that actually existing within the chamber. Not only this, but we must always be prepared to take into account a considerable loss of registering power of the thermometer through the radiation of heat, the convection of air currents, temperature of room, etc. To these influences you can always safely charge a loss of registering power of the thermometer of at least 15° F., and usually more, often 20° F. If these figures can stand verification, and I declare that they can, what will be the result? Simply this: The man who does not expel the atmosphere from the pot really subjects his case to at least 30° F. of temperature more than that indicated by the thermometer. If he does expel the atmosphere he still has 15° F. more than that registered. From this point our deductions are easy. We have declared that the destruction of vulcanite begins at 300° F. actual. As an illustration of this point, let us imagine a case being treated at the old-fashioned 320° F. without regarding these two influences. The result is easy. Instead of 320° F. we have at least 350° F. If the stratum of atmosphere *is expelled* we still have 335° F. to which our case is being subjected. If these figures and those preceding them are correct, we find ourselves treating vulcanite anywhere from 50° F. down to 35° F. above where the destruction of the compound actually begins. We are now asked what will be the manifestations of this unscientific treatment of the most abused and least understood body in the dental world. Every child in the land associates with rubber the property of elasticity, and that to the degree of exceeding in this respect any other body known to him. Do the high-temperature plates retain this characteristic? By no means, and, on the contrary, they have entirely lost it. Why? Because the extreme temperature to which they have been subjected has destroyed this natural inherent characteristic.

The early workers of vulcanite will tell you that to-day we cannot produce a plate which can be constricted at the heels, as they "used to do," and thereupon see it return to its former relations. The reason for this is obvious. The pioneers in vulcanite were instructed to vulcanize at a low temperature, about 280° F. Besides this, the machines placed upon the market at that date were so constructed that the heat was carried up and redirected upon the pot, thereby losing but little by the convection of air currents and radiation. If this be true, we now have to account only for the loss of the registering power of the thermometer by virtue of the stratum of air left in the pot. We have stated this in degrees to be equal to 15° F. to 20° F. This reasoning will easily solve the true degree of heat to which the case was subjected, and at the same time demonstrate why that property of elasticity was not lost in the work of the vulcanite pioneers. The next manifest injury to the base for our purposes will be in its extreme contraction. It should be borne in mind that vulcanite is affected by thermal changes more than any other solid body. Its rate of expansion in ordinary temperatures is somewhat over six times that of iron, about five times that of brass, and nearly four times that of zinc. This extraordinary expansion upon the application of heat will conversely manifest itself by contraction when the opposite thermal condition is applied. How and where will this extreme contraction be manifest in dental plates? If your case be of the stupidly contrived "gum sections" it can express itself only at one point, namely, by a contraction at the "heels," and a consequent raising of the body from contact with the model, most manifest at the posterior part, but really extending itself well anteriorly. How can this be demonstrated? There is but one way. Perserve your model after vulcanization and restore the plate to it, when the extreme degree of contraction will be only too manifest. The base will have no manner of contact at its posterior part with the model upon which it was vulcanized. This contraction in case of the use of "gum sections" with properly ground joints must necessarily be at the rear, as the arch cannot be crushed. In the use of "plain teeth" the contraction is diffused throughout the entire plate, and consequently does not appear so prominently at the point mentioned.

The question may be asked, "How can the model be preserved?" This is perfectly easy. As soon as the temperature is reduced to the proper point, open the flask, remove the denture from the model, and at once place the model over a gentle heat for a time sufficient to expel all moisture.

Another result of excessive temperature in vulcanization, and the inevitable contraction in the molecular rearrangement which will follow, may manifest in cracked sections or "chipped" joints.

Still another condition may present the case with one or more "spongy" points, usually to be expected at the thickest part of the body. The writer's deductions from the foregoing are that all bodies of vulcanite treated at a temperature above 300° F. (actual) will show—

1. Destruction, increasing proportionately with temperature elevation, and loss of elasticity.

2. Extreme contraction, resulting in the plate having no membraneous contact across the posterior part.

3. Broken or cracked sections, or "slivered" at joints.

4. Sponginess of vulcanite at thickest portions, which may be manifest over a considerable surface, or may appear only at certain points in size and shape quite like a split pea.

Remedy.—Any or all of the foregoing results may be obviated by maintaining a temperature within the vulcanizing pot throughout the entire period which shall not exceed 300° F.—*Cosmos.*

Reviews.

"LEHRBUCK DER CONSERVIRENDEN ZAHNHEILKUNDE," by **W. D. MILLER**, Professor an der Universität, Berlin, published by Georg Thieme, Leipsig.

This book, like all Dr. Miller's writings, has the merit of extreme lucidity, whilst the large number of excellent illustrations fully explain the various mechanical points which such a book must describe. The matter is treated in a full and systematic way, and the teaching is sound and tempered by moderation. To some practitioners parts may seem unduly laboured, as, for instance, in the definition of soft and hard gold, and in the preliminary remarks to many of the divisions of the book, however, this may, perhaps, be of value to a new student. For the most part the teaching is that usually accepted, so that, though we may and do congratulate Dr. Miller on the result of his labours, yet there is but little new for a reviewer to select. Porcelain inlays and tips are described though, perhaps necessarily, but certainly somewhat arbitarily, crowning is not dealt with. With regard to many of the cases of porcelain tips illustrated and described, especially on pages 186 and 191, we fail to see that these can compare with a whole or faced porcelain crown, either from an artistic or an utilitarian point of view. Hand pressure in working gold is, we believe, far more largely used than Dr. Miller credits ; at any rate it is so in this country. Palladium, too, is still, we believe, occasionally used, and would probably be more so were it not for the costly and somewhat wasteful nature of this amalgam. It is interesting to note that the antiseptic action of copper is lost when alloyed with tin for the purpose of making an amalgam. The addition of tin, 2 to 3 per cent. to copper prevents that dissolution of the amalgam at the cervical edge which is so frequently seen when pure copper amalgams are used. This Dr. Miller explains by the experiment that whereas copper alone is soluble in weak solutions of lactic acid, contact with a metal electro-positive to it prevents its dissolution. Dr. Miller gives in detail his system of sterilizing instruments, he prefers, when this is practical, to do this by boiling in a 1 to 2 per cent. soda solution, but in his own practice he uses a 4 per cent. solution of lysol, one set remaining in this solution whilst another is doing duty by the succeeding patient. It is dangerous nowadays to suggest that sterilization of instruments can be too fully carried out ; but we certainly venture to think that mirrors are not the most likely of our instruments to carry infection, not that we doubt that it is possible for septic matter to pass between the glass and frame, but because they are seldom brought in contact with the tissues of the mouth. As a mouth wash Dr. Miller recommends benzoic acid, 1 in 300, but he rightly insists that mouth washes cannot and do not take the place of mechanical brushing, and we are in perfect agreement with his advice to use small brushes. Large ones cannot possibly be moved freely about in the mouth, nor reach out of the way places. His classification of the forms of inflammation of the pulp resembles that of Arkövy. By-the-bye can no one suggest a better term than the mongrel word " Pulpitis? "

"THE DENTAL SURGEON'S DAY BOOK, New Edition," has been sent us by the Dental Manufacturing Company. It has been improved by the addition of a chart of the teeth.

" THE DENTAL SURGEON'S DAILY DIARY AND APPOINTMENT BOOK FOR 1897," published by John Bale and Sons, Great Titchfield Street, Oxford Street, W. Price, 6s. Interleaved blotting or ruled paper, 7s. 6d.

A useful book, differing from that for 1896 only in the colour of its cloth binding, and this distinction is an advantage.

" THE DENTAL MANUFACTURING COMPANY'S APPOINTMENT BOOK, 1897," price 3s. 6d., is, we are informed, already sold out, a fact which would seem to indicate that its popularity is well maintained.

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Original Communications.

SOFT GOLD.

By WILLIS P. SMITH.

DURING the Christmas holidays the man advanced in years loves to recall the joyous reminiscences of the days of his youth and manhood. During the Christmas holidays, too, the present lines have been written, but in contradistinction to the fond recollections alluded to, they refer no less to the present, and to the future, than to the past.

"Soft gold! Nonsense!" young dentists will be inclined to exclaim, whereas many an old professional friend will recall with feelings of satisfaction the number of beautiful fillings he has seen executed with the material mentioned during the course of his long professional practice.

As to myself, I have employed hard gold a good deal, but at present I avow that I should be better satisfied if I had done so less extensively. Slowly and gradually I have returned to soft gold. After a forty years' practice I have been obliged to establish the fact *that my soft-gold fillings in fewer cases proved failures than my hard-gold fillings*.

I am aware that Dr. Black's investigations seem to have proven that the power of adherence in both methods is or must be equal; but I am compelled to add that I have not been able to verify this statement in my practice. The number of soft-gold fillings showing defects, such as black margins, crumbling borders, &c., only amounted to three-eighths of the hard-gold fillings which I had to record as unsatisfactory and defective.

During my forty years' practice *I have not met with a single case in which the death of the nerve could be traced back to the employment of soft gold*. In using hard gold, I have at times had the most discouraging results conceivable. Even when the layer of dentine intervening between the nerve and the gold is quite thick a successful operation cannot be guaranteed. Lateral incisors filled with hard gold are sure to be affected by an abscess. As a rule the nerve is lost ; if it is saved, this is only exceptional.

Numerous large cavities, more especially those situated on the masticating surface of the molars, admit or an excellent and rapid filling with soft gold, even when the walls are quite thin, the force employed always being proportional.

Clever soft-gold fillers almost always succeed in filling the cavities in the lateral surfaces of molars and bicuspids, which commonly receive a filling of amalgam, the success of which is most doubtful just in those cases in which it would most likely seem capable of proving efficient. In most cases we can avoid using the dam, and spare the patient an inconvenience and the dentist a loss of time. Unfortunately, the art of handling a towel is also becoming more and more of a reminiscence, being almost unknown to the younger generation.

A particle of saliva getting into a soft-gold filling always constitutes a disagreeable incident, but after having wiped it away one may quietly go on filling. When I was young I was even accustomed to disregard the saliva in making fillings, especially on the lateral borders of molars. Many—nay, most of these fillings—have lasted to the present day. If Herbst, the discoverer of the rotation method, chooses to call the filling of teeth with soft gold a new invention—his submarine gold foil is a special preparation for the purpose—he is only recoining something known long ago.

However, I do not wish to be misunderstood. Whenever I can prevent saliva, and be it only an atom, from entering, I do so. I regard a filling into which saliva has entered as inferior, but, be it remembered, *only on principle and on general grounds. In practice I have not been able to note any inferiority in point of quality.* It must likewise be considered a great advantage that the rapidity with which soft-gold fillings can be made exceeds that of hard-gold work by over 50 per cent.

So much in general for soft gold and its advantages. In writing the present lines I see before me a set of soft-gold pluggers. I bought two sets of this kind 42 years ago. The patterns were those of Dr. Gardet, of Philadelphia. After a use of 10 years, the handles of one set were so worn out that I had others made of ivory; the latter have lasted to the present day. The handles are rather thick, and stronger than the handles of scrapers for vulcanite work. I chose ivory for the reason that it does not wear out as easily as other materials.

I may be permitted to add a few statements about hard gold. I have always used the latter very extensively, and am an adherent of contour-fillings; but, whenever I can, I prefer soft gold to hard gold, fully admitting, as I do, the advantages of the latter.

During the past year I had the pleasure of spending 14 days with Dr. Sandré, and saw the contour-fillings of this master of hard gold. I had occasion to see the most difficult fillings conceivable either finished or made in my presence. Although I never have beheld work more wonderful, and regard Dr. Sandré as the classical hard-gold worker, I must add that the latter also employs soft gold very extensively. The fact that a man of such reputation uses this material is sufficient proof, I think, of its not being devoid of advantages.

Our great professional friend, Dr. Evans—well-known, too, on account of his having assisted the Empress Eugenie in escaping from the Tuileries—almost exclusively used soft gold during his entire professional life. Regarding other eminent men that did so likewise, I might mention Prof. Michaels, Dr. Bing, Dr. Stevens, and others. In Germany I know of no really great gold-filler, with the exception of Dr. Abbot, although it was the American dentists that gave a fresh impulse to German dental science and art. In England soft gold is used to a great extent, even in the schools, and I have heard many people say that English students are turned out with a better manual training than Americans.

Let me, lastly, give it as my opinion that working with soft gold is the best training for a student—it also prevents the practitioner from getting a massive hand.

I called the foregoing lines reminiscences—in reality, they turned out to be more. In consulting my ledger for the purpose of obtaining the dates mentioned, I acquired a sort of general view of my professional life, recalling many successes, but also quite a number of failures. I may be permitted to say something about the latter on some other occasion.

"REST." *

By W. B. Woodhouse, L.R.C.P., M.R.C.S.

Mr. President and Gentlemen,—In choosing "Rest" as the subject of my paper this evening, it was not because we, the students of the Dental Hospital of London, forget its existence, nor partake too scantily of such a pleasant food, though our elder brethren in practice are apt to do so, nor was it because I hoped to weld and twist such a subject into one that was purely "Dental" in character; but, trusting that the majority of us sometimes have a soul above those matters which immediately concern the daily routine of our professional work, I have endeavoured to point out, as shortly as possible, the priceless value of Rest—physiological as well as mechanical Rest—when viewed in the light of what is at once the simplest and most effective natural therapeutical agent we have at our command. What is Rest? the rest necessary to a broken jaw, an irritable ulcer, a distressed mind or wearied brain differs widely in character, though not in result; yet I think we may define "Rest," fairly accurately, as a more or less complete freedom from its own peculiar function or occupation of any limb, or special sense of the body.

Nature is ever calling to our notice the fact that rest is indispensable; after an injury, it is the pain that suggests the desirability of rest—in many cases commands it—while every deviation from that necessary state will remind us at once, through pain, that we are straying from a condition essential to the restoration to health, or to the complete use of the damaged part; hand-in-hand with rest go growth and repair, of which latter growth may be styled the antitype, and so intimate is this association of rest and growth that, on a superficial view, they appear to stand to each other in the relation of cause and effect; accurate observation of the animal and vegetable world certainly reveals their perpetual co-existence, and growth, as a general rule, will be found to proceed, *pari passu*, with physiological rest; the great John Hunter paid no inconsiderable portion of his attention to the subject of rest, "most plants," he says, "have their periods of growth and rest; some close their leaves, others their flowers, at certain hours of the day or night, and this, too, with remarkable regularity." Every one knows it to be a fact that in infancy the child who sleeps much mostly thrives, whereas, on the other hand, it is equally true that the wakeful, restless, fretful child but seldom displays the evidence of active nutrition, and the result of this will be manifest as the child attains to adult life in the form of a feeble body, ill-developed teeth or weak intellectual powers ; it is in infancy that development exists in its highest state of activity ; the healthy infant passes the greater portion of its life in a state of rest and sleep, thus growth, the renewal of some parts and the fresh development of others, seems to claim sleep and rest as its especial helpmate, and should the body, in its then delicate state, be deprived from any cause of these it must hereafter suffer, for what law of nature, however trivial it may seem, can we violate with impunity ?

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* A Paper read before the Students' Society of the Dental Hospital of London.

Sleep is the greatest, the most complete form of rest, provided us by nature, as an example of its beneficial influence those people who drop off to sleep quickly, and enjoy at the same time a sound, dreamless sleep are (other things being equal) capable of sustaining a greater amount of mental and bodily exertion than those who find difficulty in falling asleep, who sleep lightly and dream much, awaking but little refreshed. Though occupying a prominent position in the various modes of rest, sleep is not the only one, though probably the most universally employed ; for example, let us take a man, worn out and exhausted by mental labour, a candidate fresh from the examination table, or one confined to long hours of indoor work—what form of rest or relaxation does he seek ? Is it not some form of physical exertion, riding, tennis, golf, rowing or some other means by which he puts out of action those powers which are overtaxed and exhausted, and calls into play those that have been lying idle ; under these circumstances some parts of his brain are nearly, if not entirely, at rest ; whilst other parts are occupied with their appropriate functions of regulating muscular exertion ; he is, in fact, calling into activity the latent or suspended functions of his cerebral centres and leaving the higher, the more intellectual part of the brain, to work out its own recovery from fatigue and exhaustion by rest ; somewhat in a similar way, but on a larger scale, we see the effect of complete "Rest" in the minds of many lunatics, the insanity of these unfortunate beings is in a large percentage of cases the result of overstrain—over-taxation of one particular part of the intellectual centres. Overstrain may have been brought about in many ways; but into this question it would be out of place to enter further here, for these cases nothing further is required to restore the mental equilibrium to its former perfect balance than rest, by which I do not wish to imply an indolent useless life, but rather do I mean such a manner of spending their days as will afford to their overwrought faculties a means of regaining their normal elasticity.

Having thus briefly reviewed the subject of "Rest" with regard to the body generally, let us for a few minutes consider what expedients nature adopts herself to secure the same end in—or to lighten the labour of—its individual organs.

I believe it is a generally accepted physiological axiom that every structure or organ, while actively employed, is in a state of vascular excitement or turgescence, and, therefore, enlarged and subjected to increase of work; as examples I might mention such viscera as the stomach, liver, and spleen during digestion; moreover, during the active state of some organs, it invariably happens that nature has so ordained the working of the human mechanism that other organs may be in a state of quiescence and receive a diminished blood supply in order that this may be carried out; the most familiar example of this is the drowsiness that most of us have experienced after a full meal, the blood being withdrawn from the brain and other parts of the body into the digestive system so as to afford more or less rest to those other parts not in request at that particular time; if we break through this regulation and force certain parts of our body to work when nature has directed rest, or cause any one part to work during an excessive period, the result will be that other parts suffer owing to the diminished vascular supply they receive, and the overwrought organ, though it may cause hypertrophy, will in the end be unable to perform its work with normal vigour. As of special interest to us I might here mention a fact, which I believe was first pointed out by Mr. Smith Turner in his Presidential Address to the Odontological Society, that if the brain is unduly exercised, more especially in young people, the teeth receive a diminished blood supply in consequence, the result being that their structure is defective and they quickly decay.

Some organs, such as the liver and spleen, are provided with capsules, but the beneficial effect of their elasticity may not be at once apparent; as soon as the state of physiological excitement begins to diminish this capsule, by inducing a constant, equable, and centripetal pressure, tends to maintain the healthy, quiescent size of the organ ; the extremely elastic property of the lungs aids without muscular force the return after each inspiration to a state of rest and quietude. In the case of the brain, enclosed as it is in a hard, unyielding shell, we have the cerebro-spinal fluid serving an analagous purpose to that of the elastic capsule in the other organs ; as the local hyperæmia—consequent on activity—subsides, so this fluid (which has been forced by the enlarged brain to the base or sub-cerebral spaces and thence into the vertebral canal) rises again gradually into the ventricles and subdural spaces creating a suitably adapted pressure on the surface strata, thalam, and vortex, thus reducing them to their size of inactivity and sustaining them in a condition of rest. The heart, though in constant action, has a period of inactivity in which to enable the tired muscle to prepare for its renewed exertion and the period will be found to exceed that during which the heart is contracting or actually at work ; after the first sound comes the second and then the long pause ; in the heart, also, two provisions may be met with for giving rest and sparing distress to that part of it which is most liable to over-distension—one, the imperfect closure of the tricuspid valves, by which some reflux is permitted into the right auricle and adjacent cauvæ, the other, the existence in many animals of the "moderator band of distension"—a muscular band passing from the septal or fixed wall of the right ventricles to the opposite, or yielding one. Besides these instances, by which I have shown how nature gives rest to, or lightens the labour of her organs or structures, she also adopts a line of practice which we call the "Law of Parsimony" ; thus, by availing herself of the inorganic forces always at work, or by the employment of a lowly organised or vitalized tissue, such as elastic tissue, she can spare herself the manufacture of more extensive structures, such as muscle. Where a suspensory muscle for the eye can be dispensed with altogether, for instance, or where there is a more or less closed bony orbit, as in ourselves, and an airtight cavity formed by it, together with the soft tissues lining it, there atmospheric pressure is entrusted to steady the eye in the socket just the same as atmospheric pressure refixes the tooth loosened by inflammation and holds the head of the femur in the acetabulum. That strong structure, the ilio-tibial band, passing, as it does, from the anterior super spine of the *Os Innominatum* down to the head of the tibia, saves a vast amount of work to the muscles which maintain the erect position ; in the same capacity I may mention the ilio-femoral, or Y-ligament of the hip-joint, which is the chief agent in maintaining the erect position without muscular fatigue ; the action of the external muscles of the buttock being balanced by the tension of the ilio-femoral and by the rest of the capsular ligaments. Then there is the ligamentum nuchæ, the feeble development of which, in man, contrasts so strongly with the larger size and great strength of this structure in some of the lower animals, where it serves to sustain the weight of the head free of muscular exertion ; this is especially well seen in the ox.

In the eruption of the temporary dentition, nature has provided that these "milk" teeth should erupt in groups, and that between each period of eruption there is a definite pause, which acts as a beneficial arrangement so far as the child is concerned. Allowing for the recuperative powers of the young subject to counteract the somewhat exhausting condition brought about by the process of eruption.

When a serous membrane is injured or irritated, coagulable lymph is invariably poured out into the inflamed surface ; this thin fibrinous exudation acts like a temporary splint ; it prevents the surfaces in their inflamed and delicate condition from rubbing against each other, and thus by securing a certain degree of rest to the original structures contributes to the work of reparation. By this means the parts are firmly held in apposition till union between the surface is perfected. This union having taken place, the temporary medium is removed. Analagous to the function of this coagulable lymph is the callus of fractured bones ; we all know that when a fracture is not accurately adjusted or "set," or where much disturbance has taken place between the fragments, and, again, where the part is not kept absolutely immobile, nature throws out a large quantity of new material, or "callus," itself forming a splint, so as to accurately keep in apposition, for some time, the fractured portions. Such a state of things is especially well seen in fractured ribs, where, owing to the movements of respiration, absolute rest and immobility is very difficult to obtain, consequently nature pours out "callus" around several ribs, for some distance, in her effort to secure perfect rest to the injured parts.

Lastly, let us turn to general surgery ; all the best considered operations are performed for the purpose of making it possible to keep structures at rest. The operation does not cure, it only makes recovery possible, where, but for the surgeon's timely interference, nature would have succumbed to the exhausting influence of disease. In aneurysm, absolute rest—not only to the parts affected and to the circulatory system, but also the mind and to the whole system—forms the basis of all successful treatment ; in that distressing and painful affliction, cancer of the œsophagus, what fearful suffering is alleviated, and even life prolonged, by the operation of gastrostomy, whereby an opening is made in the stomach wall through which food is passed, and by means of which the patient feeds himself, thus avoiding the necessity of eating through the mouth, and affording entire "rest" to the diseased œsophageal tube. Similar rest is afforded to the rectum by Colotomy in the case of extensive carcimona, the fæcal matter passing through an artificial anus ; in injuries to the brain, concussion, depressed fracture, entire rest and quiet, and in the latter case removal of the depressed portion of bone, is all that is required, and the brain will repair itself. Deformities of diseased joints may be arrested, affording "*physiological* rest" to the joint through division of tendons. In bone or joint disease, by the proper application of a suitable splint and by the position of the limb, you afford "*mechanical* rest" to the part, and place your patient on the high road to recovery. In a simple sprain of the ankle we raise the foot and leg, and *firmly* apply a cold water bandage. What does this mean ? It simply means emptying the capillaries, freeing them from their state of congestion, and thus allowing them long rest to return to their natural and vigorous condition.

Again, in a simple abscess, remove the tension by a free incision and relief is at once afforded to the sufferer, because we have in this case also restored the part to a state of rest.

With regard to many troublesome sinuses, though they defy almost every kind of remedial agent, yet they will be found amenable to a very simple method of treatment—viz., rest. When influenced by muscular force prevent this motion by the use of gentle pressure strips of adhesive plaster, or, when necessary, by the division of muscular fascia (for we must remember there is no fascia in the body which is not influenced by muscle ; physiologically and surgically, fascia is one of the insertions of muscle). Time will permit me to do no more than make mere mention of the effect of rest on diseased hip, sacro-iliac disease, or other joint trouble.

The subject of this paper is such a very wide one that I feel that I have but imperfectly touched on a few points; had I, however, written a paper ten times this length, the subject would still be unexhausted. In conclusion, I must thank you, gentlemen, for the kind way in which you have listened to its contents.

Reports of Societies.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The Ordinary Monthly Meeting of the above was held on Monday, the 11th ulto. The PRESIDENT (Mr. R. H. Woodhouse) in the chair.

The following gentlemen were nominated for election:—Mr. Henry Wood, L.D.S.I., Norwood; Mr. J. P. Parfitt, L.R.C.P., M.R.C.S., L.D.S.Eng., Reading, and Mr. W. Kenneth Goadby, L.D.S.Eng., London.

The LIBRARIAN (Mr. W. A. Maggs) stated that Mr. C. W. Glassington had presented his book on "Dental Materia Medica and Therapeutics." He mentioned, also, that the book presented by Mr. David Hepburn in June, containing autograph letters relating to the foundation of the Society, had been rebound with a suitable inscription and placed under a glass case in the library. The usual exchanges had been received.

The CURATOR (Mr. Storer Bennett) reported that Mr. Robbins had been kind enough to present to the museum one of those interesting cases, becoming rarer every year, of a bone piece for the lower jaw with a partial set of natural teeth inserted. The specimen showed no signs of decay, and Mr. Robbins was able to state from personal knowledge that it had been worn for some years.

Mr. H. L. ALBERT, in a casual communication, gave particulars of cases of transplantation, two of the patients afterwards being brought before the Society. In the first case a superior left lateral was transplanted more than twelve months ago, and hardly any pain had been felt since. The tooth was fixed firmly and the girl was able to use it for the ordinary purposes of mastication. In the second case a superior right lateral was firmly fixed at the time of the operation, but periosteal trouble developed after the lapse of a few days and was followed by suppuration and oedema of the lower eyelid. The tooth was very loose, but became firmer in a few weeks, the patient having been given tonics and her general health attended to in the meantime. The periosteal troubles disappeared, and twelve months after the operation the tooth was quite fixed in position. In the third case Mr. Albert was asked to transplant two superior central incisors, but not having any suitable teeth at hand he cut off the roots of two that had been extracted some time and inserted them with a view to subsequently crowning. One tooth came out a week later, but the other remained firm and was crowned four months afterwards. Mr. Albert stated that he had had ten cases, all of which had been successful. His method was first to select a tooth of suitable colour and shape with a root slightly wider than the one to be removed. He had used indifferently teeth taken from living people, from dried skulls, and from the dissecting room, the only one essential being complete sterilization. The tooth was scraped, and thus denuded of its periosteum, and any deposits on the crown or neck were removed. The apex was then cut off, and an antiseptic solution injected into the pulp chamber, after emptying it of its contents. The tooth was then immersed in an antiseptic until required. At the operation the patient's mouth was washed with carbolic or Condy's Fluid, and gas administered. The tooth to be removed was grasped with clean forceps, and as much rotation as possible employed in its extraction, in order to avoid deflecting the alveolus, the socket was washed with antiseptics and the tooth to be transplanted pushed forcibly into place. If enough of the root had been excised, it would be found that the force used in inserting the tooth would have caused a white appearance of the gum in front from the pressure of emptying the blood vessels. Care should be taken to see that the bite was clear. The point Mr. Albert chiefly laid stress on was the advoidance of ligatures and splints, which, he believed, even with the most stringent precautions, were traps for bacteria, and so inevitably led to periosteal trouble.

Mr. H. BALDWIN wished to ask Mr. Albert if in all cases he used thoroughly dried teeth ? He had always used fresh teeth, and if not perfectly fresh he kept them in a very weak antiseptic solution with the idea of keeping the periosteum of the cells of the cementum alive.

Mr. F. J. BENNETT attributed Mr. Albert's success to having the root of the teeth larger than the cavity, and driving the tooth home if necessary by force so that it would be held firmly. The parts were held together during the early stages, which was extremely important. It was during the first 48 hours perhaps that any movement of the tooth was likely to cause its being thrown off, and certainly if they were able to do without splints and supports of any kind they would get the mouth into a much more antiseptic condition.

Mr. NEWLAND PEDLEY regarded the operation as most unscientific. They had been told that it was equally immaterial whether the tooth was dead or alive, whether it came from the dissecting room or where it came from. Probably a piece of wood, if driven in with sufficient force would stay there for a time. After the force of impaction was over the root became absorbed, calcification set in and there was a kind of spurious ankylosis, but in nearly all cases it was merely temporary. The operation described was really one of implantation, not transplantation ; of the cases implanted a very small proportion had been successes, luckily in many cases absorption went on in the aveolus and the teeth came out. The question had been raised as to whether it was important to the success of the operation to retain the vitality of the periosteum. If fresh teeth were ·used and put into a very weak solution it would certainly increase the probabilities of infection.

Mr. H. L. ALBERT, in reply, did not claim the operation as a scientific one, and was quite content so long as it was practical and successful. Mr. Baldwin had asked him whether he used dry teeth. He did so, and—he did not know why he should disguise the fact—he had taken teeth from the dissecting-room. Such teeth, properly sterilized, in his opinion, were as free from the possibility of infection as any others. He firmly believed the tooth was *mechanically* held, and did not see why it should not remain so held. It was known that, in certain cases, glass was tolerated, and he did not see why bone should not be. He had so firm a belief in the operation that he was beginning to transplant glass-roots with that object. He agreed with Mr. Bennett that the width of the root was the crowning point of the success—the tooth was mechanically held by its own width.

Mr. E. BALDWIN, Jun., showed models of the mouth of a girl who, at the age of eleven years and eight months still had all her milk teeth excepting the molars. She was the sixth of a family of seven, and was healthy, well developed, and intelligent. She was free from illness until her eighth year, when she had measles, and scarlet fever a year later.

Mr. A. Pearce Gould followed with a Paper, "Methods of Preventing Deformity after Removal of Portions of the Mandible." He remarked, in commencing, that it was a simple truism that the surgery of the upper jaw differed in very material respects from that of the lower jaw, and in that fact was to be found the justification for the modern phraseology which speaks of one as the maxilla and the other as the mandible—it served to impress upon them that they were not speaking of two similar bones. The maxilla might be removed without leaving anything more than a most trifling external deformity ; but with the mandible they were met by an entirely different condition, and the removal of it was an operation which had—at any rate, almost up to the present—always been followed by great disfigurement, and a most serious interference with mastication and nutrition. So far as he was aware, very little effort had been made to deal with this subject, though some mention of it might be found in old books. Sir William Liston and Sir William Fergusson had referred to it ; the latter had extensive experience in all operations about the face, but he did not give any very definite statement of the results of the operation under consideration, and it might be fairly assumed that they were not strikingly successful. Mr. Pearce Gould recalled in detail the operation of Mr. Stanley Boyd in 1893, which was attended with excellent results. He also referred at length to the Paper of Sir William Stokes, published in the *Practitioner* of July last. He then proceeded to give particulars of three cases in which he had operated himself during the last two years. It had been more particularly his object in these cases to hold aside the main portions of the bone in their proper position, so as to prevent deformity and obtain a useful mandible for mastication. The first patient was a man 52 years of age, with recurrent epithelioma of the tongue and floor of the mouth. A considerable portion of the left half of the bone was removed, and Mr. Pearce Gould followed Mr. Stanley Boyd's example, taking a piece of stout silver wire and fixing the ends in small holes drilled in the extremities of the bone. So long as he remained in the hospital the result was satisfactory, and he left for a convalescent home without deformity ; but, unfortunately, one day, in the home, something or other went wrong, and the end of the wire appeared through a little hole in his cheek. That case was not successful. The second case was that of a lady with an epitheliomatous growth, necessitating the removal of about 2½ inches of the right side of the body of the mandible. Between the extremities a steel bar was inserted, with a right-hand screw at one end and a left-hand screw at the other, the skin and mucous membrane were then stitched together over the rod. The result was entirely satisfactory. The patient had very little deformity—indeed, her chin was exactly in the median line, and the whole mandible moved in one piece, so that she could open her mouth well. The third case was one in the Middlesex Hospital at the present time. Like the first case, it was one of recurring epithelioma ; the growth involved the floor of the mouth, adhering to the back of the symphysis, and infiltrating the tongue far back. A vertical incision in the middle line of the lip, through the chin down to the hyoid bone, was made. In the meantime the tissues of the lip and the superficial tissues of the neck were turned back, the canine teeth on each side were extracted, the jaw was sawn across, and a large portion of the adjacent soft tissues removed. A good hold of the tongue was obtained by the traction ligature passed through and separating the mass of disease, the muscles in the front part of the myeloid, and the muscles of the tongue far back. In this case an attempt was made to use the steel bar with right and left screws, and at one time it appeared as if it would be successful ; it seemed to be fixed firmly in the mandible, and for several days after all seemed to go perfectly well ; then the right end of the rod was found to have slipped in the right side of the mandible. It was impossible to screw it through the mouth, but it was replaced in the hope that it would become firm. A few days later the left end was discovered to have got into the cancellous tissue. It became necessary to remove the bar, and, for the present, to desist from any attempt to correct the deformity. The cases which he had had, he thought, might be taken as fairly representing problems they had to deal with. In some cases it was the lateral portion of the mandible which had to be removed, and in others—perhaps more frequent—it was the central portion. He thought that what was wanted was some apparatus which would hold the two fragments apart, and be able to resist the firm pressure of the internal pterygoid muscles, and also the pressure which tended to drag these two portions together—something rigid enough to hold the bones exactly in their normal position, and at the same time capable of being readily adjusted. It was not always possible to say before an operation exactly what length of bone might have to be removed. What was wanted was an apparatus that could be adapted easily and quickly to the different cases. He was not prepared to say what precise form it should take, and would be glad of any suggestions thrown out in the course of the discussion which might afford help in this very important part of surgery.

Mr. STANLEY BOYD reminded the Society of the case which he had brought before them some time previously, to which Mr. Pearce Gould had not alluded, in which he had to resect a piece of the lateral portion of the jaw. In that instance he put a portion of a knitting-needle between the extremities of the remaining portions of the mandible, thrusting one end into the dental canal and the other into a drilled hole in the central part of the bone. The result was very satisfactory. Later the needle became displaced, but he was unable to find it. The patient had no pain after that, and was fitted with a denture by Mr. Colyer ; so long as he saw her her bite was correct. It seemed to him the points of importance in these cases were, first of all—as Mr. Pearce Gould had said—to have some material they could cut to any length they wished, and a material that would easily heal in. He did not think there was anything better than highly-polished steel ; it was strong, could be broken to any length they wished, it had an absolutely smooth non-absorbent surface, and did not rust. Mr. Gould's first case showed the importance of having a shoulder—obviously the point of a knitting-needle resting against bone when the traction was so very considerable as granulation tissue always exerted was not likely to be successful. He was inclined to think that a largish shot clamped on to the needle at any point wished, like the ordinary shot-suture, split half through and clamped on forcibly, might be less complicated than having screws at each end. The next point of importance, he thought, was to obtain union as quickly as possible, so that a large quantity of granulation tissue might not be formed, for in proportion to its amount would be the traction tending to force the spanner through the bone. He was sorry not to have heard the whole of Mr. Albert's paper, and for that reason hardly felt in a position to discuss it ; but, it seemed to him, to expect anything to hold in by pressure, even if it was driven in, was not a hope well founded.

Mr. STORER BENNETT thought one of the great dangers to be encountered in treating such cases as Mr. Pearce Gould had reported, by putting wires or anything similar into the substance of the jaw, was that they were very liable to get a small amount of necrosis in the piece of bone immediately surrounding the wire inserted, which would lead to a good deal of subsequent trouble. Another reason for the non-success of the wires was, he thought, they had something else to guard against besides the mere approximation of the fragments ; they also had to take into account the rotation of the fragments on the bar. If, in addition to the wire inserted in the substance of the jaw, a Hammond's splint were applied to the teeth themselves in those cases where the teeth were *in situ* he believed they would very largely counteract the rotating tendency.

Mr. G. CUNNINGHAM said the first thing that struck him in the discussion was the absence of any reference to foreign methods. The work M. Claude Martin had accomplished had been published and was worthy of consideration. His method was to prepare before the operation a jaw resembling as nearly as possible that which the surgeon was going to operate upon. He then made a rough study of the part to be removed and took into account the need of some apparatus capable of adaptation to the requirements of the surgeon. The material he employed was vulcanite and with it he constructed a duplicate in shape and form of the part to be taken away, which he substituted. It was secured to the remaining portions of the manible by means of platinum bands with ordinary steel screws penetrating into the substance of the bone. He had had great success with this method of treatment, but another surgeon, perhaps even more famous, in conjunction with a very expert dentist, proceeded on a different plan altogether. This surgeon thought that M. Claude Martin counted too much on obtaining a firm hold for his screws in the cancellous part of the bone ; he preferred to go outside the part of the bone and not depend on any screw. There was another objection to M. Claude Martin's system, viz. ; that the plates bore on the body of the jaw and covered a certain portion of the periosteum, making it probable, if not certain, that necrosis would be going on underneath them. The alternative plan was to substitute a rounded surface for a plate, and so get a firm hold with as little contact as possible. The apparatus employed by the surgeon he was speaking of consisted of a kind of crib, which embraced the ends of the bone, and the space between he filled up with a sort of framework of interlaced wire made of strong platinum. The device of Sir William Stokes, which had been mentioned, seemed to contain the same essential principles, with the difference that it was not sufficiently strong to stand great pressure. He would like to ask the eminent surgeons present whether in those cases where the jaw was removed it was not sometimes the fact that the tissue most likely to lead to the recurrence of disease might be in the cancellous structure of the bone? If so, instead of taking out part of the jaw would it not be better to remove the whole and put in an artificial jaw including the condyles? He was convinced that there was a great future for dentists in this class of work, and he believed the sooner surgeons of the country sought their co-operation the better it would be. There was no question that in this department of surgery France was very much before England.

Mr. Dennison Pedley referred to a case which had recently come under his notice. Some years ago Sir William McCormack operated upon a man with epithelioma of the tongue. Shortly afterwards necrosis took place about an inch on each side of the divided portion of the jaw. The jaw at once assumed an acute angle, but it was thought necessary to keep the portions of the jaw separated and a piece of gutta percha was introduced into the mouth for that purpose until some healing had taken place. A few weeks after the man's mouth was in a good enough condition to be able to take a model from, which was accordingly done, and a simple vulcanite splint was made with four teeth on it and inserted. The case went well until, unfortunately, recurrence of the disease occurred. The second case was that of a child, whose jaw was smashed in three or four places by an accident. The surgeon wired up the end, and he (Mr. Pedley) took a model of the mouth, deformed as it was, then cut out a piece of the plaster model so as to make the jaw into its proper form again, and made a Hammond splint round the teeth, which he put in carefully under chloroform. Fortunately, the periosteum was not sufficiently injured to prevent perfect union taking place, and so the whole of the tissue was reformed. He would suggest that wherever a patient had teeth a model of the mouth should be taken before any operation was performed, so that a splint could be made, in order that when the portion of the bone had been removed it might be inserted.

Mr. J. H. Redman said that in a case where the central portion of the jaw was removed he took an impression of the mouth and made a gold plate to fit over the back teeth on each side, and put two gold bars to attach the two splints together. The device answered admirably. Unfortunately, the girl died from some cause or other before the case could be completed ; but for the time being it answered well. His partner had had a similar case, which, at the end of three years, was going on well. He agreed as to the importance of taking an impression before the operation.

Mr. H. Lloyd Williams spoke of a case where a portion of the jaw had been removed, and, in order to keep the parts from closing up, he used a Hammond splint. He found that the pain caused by the traction of the cicatrixes and the resistance of the splint on the teeth was so intolerable that it had to be removed.

Mr. J. F. Colyer said, fortunately, at Charing Cross Hospital, those of them who were dental surgeons were nearly always asked to see the jaw cases that came in, and, therefore, if they thought there would be any chance of remedying the deformity after an operation they nearly always had an opportunity of doing so. There was one case which he thought was peculiarly instructive. A patient came to him with a fairly extensive myeloid sarcoma on one side of the mandible, necessitating the removal of the mandible on that side, including the condyle and coronoid process. He then endeavoured to put in a vulcanite plate covering the upper, and practically putting in a splint in the lower, embracing the remaining teeth and going along the portion which had been removed with a spring on the affected side, which had a tendency to push the remaining half of the mandible back into place. So far as that splint went it was perfectly successful—it always kept the teeth back in place, and, at the same time, the articulation was good ; but the patient began to suffer from fairly extensive inflammation on the surface of the bone just in contact with the splint, and there was also periostitis round it ; he therefore took it out. He heard the other day that the boy was still alive, and there had been no recurrence, although the operation took place over five years ago. He did not think there was any difficulty in keeping these portions of the jaw in place ; the only question was whether they could overcome the contraction of the cicatricial tissue. It seemed to him there were very slight hopes of doing so, and, supposing they succeeded, he would like to know what were the chances of the splint causing recurrence. He had heard a good deal of the various devices Mr. Cunningham had referred to, and they had been seen in the rooms of the Society ; but how long and how far were they successful ?

Mr. WILLIAM HERN was opposed to screws in view of the large body of evidence that they caused necrosis, and advocated a splint of some kind in their place. He narrated the particulars of cases supporting his views.

Mr. NEWLAND PEDLEY had had the same difficulties to contend with enumerated by the various speakers. Most of his cases had been failures, and he was prepared to admit that splints, screws, and similar appliances should not be introduced. The only successful case he remembered was that of a child, nearly the half of whose lower jaw, including the condyle, was removed for sarcoma. In that operation the mouth was not invaded, the incision running externally. There was very little chance of contraction of cicatricial tissue too ; but he controlled the tendency to displacement, not by any apparatus fixed on the ends of the bones, but by a plate fixed on the upper jaw. He thought that, in a large number of cases, working from the upper jaw gave the best prospect of success. The plate consisted of a vulcanite cap passing over the upper teeth, and from it a plate of vulcanite was brought downwards between the tongue and the lower jaw, which was made extremely deep and inserted in the mouth when the mouth was opened as widely as possible, and the moment the mouth closed the jaw closed, and was so firm that mastication could be performed. That was by Liston's splint, and it was the only one that gave satisfaction.

Mr. BALDWIN strongly recommended M. Claude Martin's book to the members for perusal.

Mr. PEARCE GOULD, in the course of a brief reply, said Mr. Redman had kindly given him a drawing of the splint he used, and had suggested that, even in an edentulous jaw, a gold cap might be so firmly fitted on to the edentulous gum that the bar attached to these caps would hold the jaws apart. If so, he could not help thinking that that would be a very happy way of dealing with the cases. Though much was to be said in favour of M. Claude Martin's method, the fact that the liberal-minded and eminent surgeon Mr. Cunningham had named was not favourably impressed with it had great weight with him.

The usual votes of thanks concluded the meeting, which was adjourned to February 1st.

DENTAL STUDENTS' SOCIETY, DENTAL HOSPITAL OF LONDON.

THE Annual Meeting of the above Society was held on Monday, January 18th, at 7.30 o'clock. The PRESIDENT (Mr. J. F. Colyer) in the chair.

The following officers were elected for the ensuing year :—*President*, Mr. C. F. Rilot ; *Vice-Presidents*, Messrs. Trewby and Nowell ; *Treasurer*, Mr. Green ; *Secretaries*, Messrs. Colyer and Woodhouse ; *Curator and Librarian*, Mr. J. C. Douglas ; *Second year's Councillors*, Messrs. Thew, Austin, Schlesinger, Manning and Ashby ; *First year's Councillors*, Messrs. Ackery, Cardew, Apperly and Barton ; *Microscopist*, Dr. Miller.

Mr. DOUGLAS (the Curator and Librarian) read a short and satisfactory report.

Mr. HEATH (the Treasurer) and Mr. NOWELL (the Secretary), presented their reports.

All three reports were adopted unanimously.

On Casual Communications being called for—

Mr. A. E. WALLER showed a very unique specimen of a rabbit's skull with an underhung bite. Owing to this fact, the opposite incisors had not met, and so had gone on growing to such an extent that the lower incisors, which had deviated somewhat to the right, struck the side of the nose every time the jaws were occluded. When the animal was captured it was found to be considerably emaciated ; the nostrils were bleeding and very inflamed, and the nasal bones bent towards the left side. Mr. Waller kindly presented the specimen to the Museum.

Mr. JENKINS showed and presented to the Society a three-rooted lower molar, which he had extracted from a patient aged 17.

Mr. A. P. HEATH showed a drawing of a section of the palatine root of an upper molar with two Morey drills broken in it, *in situ*. The drill, half way up, was first broken and impacted ; it was left *in situ*, and an amalgam filling put in the tooth. Two days after there was a slight swelling in the palate and a good deal of pain ; the swelling was lanced, no pus found, and the pain continued. Next day the filling was removed, and a small Morey drill passed up the root and through the apex, and the second time of passing it up it jammed and broke. The pain continued, and next day the tooth was removed, and the drills were found—the first one half way up the root, the second one about half way through the apex. Also an upper molar, with a root dressing packed between the root and the alveolus. An amalgam filling was removed from the tooth —because the pulp had died—and the septic roots drilled out without enlarging the cavity much. The drilling caused the patient a good deal of pain. The roots were then dressed with iodoform, and a guttapercha filling inserted. The pain continued, and was greater in the evening, when the dressing was removed and a fig poultice applied ; but the pain being still very bad, the tooth was extracted in the morning. The root canal had been faithfully followed, but, being small and near the side, became opened all the way down by the drill, and the dressing was packed between the root and the alveolus, and even a little beyond the root. Both specimens were presented to the Hospital Museum.

Mr. GABELL showed a pulp-stone, with the palatine nerve attached to it, from the left upper first molar of a girl aged 24 years. Family history of gout. The patient had pain from a mesial cavity with an exposed pulp. Arsenic was applied, and for the next six hours patient had severe pain. Two days later the pulp was not sufficiently devitalized to be removed ; arsenic was, therefore, reapplied, and, six days later, the pulp was removed, patient only having suffered very slightly since the second application of arsenic. A large pulp-stone was found and removed, bringing away with it the palatine portion of the pulp and causing sharp pain. Two smaller stones were found in the two buccal roots.

Mr. BALDING showed a model of gemmination of the left upper central, and a supernumerary, in a boy aged eight. The history of the case was as follows :—The boy had always been rather delicate, and with every tooth that had erupted, whether temporary or permanent, he had suffered convulsions. Another point of interest was that this gemminated tooth was erupted between the fifth and sixth years.

Mr. POWELL presented to the Society a stone which he had removed from the left upper first molar of a girl, aged 23, who gave a family history of gout. One month ago the patient bit hardly upon the tooth, and for the next two days she had severe pains from it. The tooth was then filled with Sullivan's amalgam, but pain became worse. A week later the filling was removed, and an oil of cloves dressing inserted. This had no appreciable effect. Three days later the cavity was enlarged, almost exposing the pulp, and an arsenic dressing applied. Twelve hours later the pain ceased, and four days afterwards the pulp and a pulp-stone were painlessly removed from the tooth.

Dr. Miller said that a patient was sent to this hospital some little while ago complaining of severe neuralgia pains over the left side of the face, and radiating over the eyes and the forehead. On examination he found the twelve-year-old molar of that side situated directly external to the six-year-old molar, and ultimately decided to extract it. The roots he found very exostosed, and, as far as he knew, the patient had recovered from his neuralgia.

The President then called upon Mr. Woodhouse for his paper on "Rest." (See page 52.)

In the discussion which followed—

Mr. Gabell said he was glad that the subject of rest had been dealt with this evening, as it was one that was very badly understood by dental students. He pointed out the advantage of rest in cases of Pyorrhœa alveolaris, and more especially in chronic periostitis.

Mr. H. Lloyd Williams pointed out the advantages of rest in the treatment of irregularities, illustrating his remarks by proving the advantage of intermittent over continuous pressure. In intermittent pressure the pressure was only exerted for a short while, and there was a considerable period of rest which allowed the tooth to return to its normal condition before pressure was reapplied. He laid stress on the fact than when using intermittent pressure, for example in drawing back front teeth, the gum behind never got congested and swollen, whereas in continuous pressure that was nearly always the case.

Mr. Green said that he considered that Mr. Woodhouse should have called his paper "The Arrest of the Expenditure of Energy," and not "Rest."

Mr. Woodhouse then briefly replied.

A vote of thanks was then accorded to the retiring President and other officers, and also to Mr. Woodhouse and to the gentlemen who had brought forward casual communications. The proceedings then terminated.

THE DENTAL RECORD, LONDON: FEB. 1, 1897.

CRITICS CRITICISED.

THE *Dental Practitioner and Advertiser,* a journal we always read with pleasure, has an editorial, in its current issue, headed—"Wrongly Directed Criticism"—the gist of which is that "foreign journals—notably the English"—in their remarks on suits at law, "especially connected with the use of anæsthetics and the extraction of teeth," condemned the dentist "because he was an unqualified and unregistered man," but expressed "not a word of condemnation for thus ruthlessly sacrificing teeth." Further, it remarks:—"The necessary iniquity of these wholesale extractions does not seem to have impressed itself upon our foreign journalistic brethren"; whilst the penultimate paragraph is as follows:—"In America, among reputable dentists, if an instance should arise in which twenty or twenty-five teeth were extracted, the resentment would be against the dentist for making of himself such a wholesale butcher. We believe that there can be no circumstances that will justify such brutality. It must be malpractice of the vilest kind, or dentistry is a humbug and a swindle. It is a burning shame to dishonour our professional name by bestowing the honourable distinction of 'dentist' upon the brute and charlatan who will deliberately and unnecessarily dig out the organs which it is his bounden duty to conserve. There is no more of 'professional' conduct in such acts than there is in making wooden nutmegs. It is an affront to medical science when her anæsthetic agents, beneficently given for the good of mankind, are prostituted to the sordid spirit of gain and the worst kind of quackery, by forcing them to pander to the most debased of the passions, an unholy avariciousness that will sacrifice the ignorant patient who was so foolish as to trust his well-being in such unworthy hands."

Now it is obvious in answering a criticism of the above kind we lay ourselves open to the retort, that it was not intended for us at all, but that, if the cap fits, we are welcome to wear it. But let this pass, for we may at once say that we make no complaint of the spirit of the article, and our remarks are to be regarded more as an attempt to put the matter from our point of view. It has been our unfortunate duty more than once to comment on fatal accidents during anæsthesia, induced by chloroform, for the extraction of teeth, and we readily recognise the fact that our remarks have not been directed against "thus ruthlessly sacrificing teeth," and, for the following reasons:—Firstly, we had to deal with a case of death, due, as we believed, both to the use of the wrong agent for inducing anæsthesia for this particular operation, and to its administration by an unqualified, therefore—*probably*, indeed—the result would show *certainly*—an unskilled man. In the one scale place the cause of death, in the other thirty-two teeth, to which side will the indicator point for criticism? Secondly, would it tend to strengthen or to weaken our remarks were we to dilute our arguments against what is *certainly* wrong by referring to what is *possibly* so? and, Thirdly, is not the first axiom of all just criticism, be sure of facts? Would it not be wise to ask the condition of the teeth extracted? the names of the teeth lost? and would not the pecuniary position of the patient affect our judgment?

Let us look at these points a little more closely. There is, of course, a stage of decay when a tooth ceases to be savable by filling, it may be reduced simply to a root or be little more than such; to save such a tooth requires long treatment and the adjustment of a crown. The patient is of the very poor, little to wear, less to eat, and soul and body hang together solely as the result of hours of unremunerative labour. He cannot, and would not, give the time needed for the treatment, and if he could and would, who will do the work? Dental hospitals? There are none in the town. Must the patient bear the pain he suffers and run the risk of septic trouble because our views of dentistry are lofty and ideal?

There is not one tooth, but many teeth, all in the same condition; in fact, but few are more than roots, and these few are decayed. Charity steps in to help, but the sum available is two, three or four pounds; is the man guilty of "malpractice of the vilest kind," and are his motives "prostituted to the sordid spirit of gain and the worst kind of quackery," if he elects to remove the whole of these rotten stumps and give the patient an appliance that will serve him for years, rather than to *try* and save some few teeth, which will certainly not last many months, and the loss of which will render another appliance necessary? And of such cases there are hundreds. We deplore it; we try to prevent it by attention to children's teeth; by teaching cleanliness; by urging the patients to have the teeth seen to regularly. But, again, are we to refuse aid to such as we have mentioned because our stomach is above "making wooden nutmegs"? And if we adopt the only available treatment are we "wholesale butchers"?

In this editorial, which is the subject of our remarks, a case is mentioned of a boy, aged ten, "who had at one operation eight teeth extracted under chloroform and subsequently three more"—that is eleven in all—certainly a large number. But before we hasten to condemn the operator on this ground, firstly, we must ask, which were the teeth extracted; secondly, presuming some to be savable, were gratuitous services available, and, if not, could the patient pay the minimum fee? Of the second point details are absent, and we cannot, therefore, discuss it, but of the first we can give, at any rate, a reasonable explanation, which would at once place the operator beyond such severe criticism. The dentition of a boy at ten would probably be represented by the formula—

$$\frac{I_1, I_2, tC, tM_1, tM_2, M_1}{I_1, I_2, tC, tM_1, tM_2, M_1} \times 2 = 12 \text{ permanent and } 12 \text{ temporary teeth.}$$

It is obvious, therefore, that the whole of the eleven may have been badly decayed and possibly loose temporary teeth. But abandoning this explanation as unlikely, since chloroform was administered twice, we arrive at the probable explanation that the four permanent molars were extracted and that the remaining teeth were temporary ones; this would allow that some of the temporary molars were already replaced by their permanent successors. Now, surely, whatever views we may hold as regards the teeth we have mentioned, and though our views may differ with regard to the expediency of the above extractions, yet no representative body of dentists would judge the operator to be a "brute and charlatan." If not, should we?

Having at some length debated this question, we feel bound to affirm that we were perfectly right in directing our criticism to a proved wrong rather than to what might possibly prove to be right. And we hold that our silence is by no means open to the interpretation that the iniquity of "these wholesale extractions does not seem to have impressed itself upon our foreign journalistic brethren. They mention the matter without a shudder, and pass it off as a thing of course. They comment upon the other aspects of the case, and deplore the visitation of Providence when the poor victim dies, but do not seem to have any idea that the extractions were not justified, and, perhaps, necessary." We note it is only "not *seem*," but, perhaps, Mr. Editor will accept our assurance, that he may in future leave out the negative. It is the aim and object of every reputable dentist "at home" to bring about a condition of affairs that will render these wholesale extractions unnecessary; but, before passing criticism on our holding the view that some (we do not by any means say all) of the extractions may, under the circumstances, have been actually needed, the writer should pay a visit to some of the pauper quarters of the great cities of the Old World. By-the-bye, it was because we doubted "the visitation of Providence" and believed the instrumentality of man, that we wrote our share of the so-called "wrongly directed criticism," we are glad to receive an authoritative assurance to the contrary. The next defendant in such cases should subpœna this writer, who we sincerely hope may not have unduly *tempted* Providence by *deploring* the "visitation." Was it not rash?

News and Notes.

THE *Dominion Dental Journal* issues with its first number for this year—the Queen's Diamond Jubilee—a portrait of the Queen's dentist, Sir Edwin Saunders. The portrait, however, is not a very recent one.

THE same journal, in its "Post-Card Dots," says that "Dr. J. R. Spooner, of Montreal, introduced arsenic as a devitalizer of the pulp. It was announced to the profession in 1836 by his brother, Shear Jashub Spooner, in his little work, 'Guide to Sound Teeth.'"

ROYAL COLLEGE OF SURGEONS, ENGLAND.—The following gentlemen, having passed the necessary examinations, have been admitted Licentiates in Dental Surgery:—Charles Edward Carter, Middlesex and the Dental Hospital of London. Harold Ernest Cribb, Charing Cross and the Dental Hospital of London. Walter Green, Charing Cross and the Dental Hospital of London. Percy O'Bryen Hartnoll, Charing Cross and the Dental Hospital of London. Jack Edmund Humphrys, Charing Cross and the Dental Hospital of London. Ernest Jeffery, Middlesex Hospital and Dental Hospital of London. William Jones, Middlesex Hospital and the National Dental Hospital. Charles Albert Malone, Charing Cross and the Dental Hospital of London. Thomas Cyrill Myers, Charing Cross and the Dental Hospital of London. Ernest Garner Parrot, Charing Cross and the Dental Hospital of London. John Henry Robertson, Charing Cross and the Dental Hospital of London. Henry Watson Turner, Middlesex and the Dental Hospital of London. Samuel Thomas Wale, Middlesex and the Dental Hospital of London. William Borrett Whittington, Charing Cross and the Dental Hospital of London. Ralph Littlewood Young, Middlesex and the Dental Hospital of London.

Guy Chatterton, Guy's Hospital, Dental Department and School John Alexander Malin Donston, Guy's Hospital, Dental Department and School. Clement Needham Doyle, Guy's Hospital, Dental Department and School. George Garnett Ellis, Guy's Hospital, Dental Department and School. Sydney James Evans, Guy's Hospital, Dental Department and School. Kenneth Weldon Goadby, Guy's Hospital, Dental Department and School. Thomas Dawson Edwin Goodman, Guy's Hospital, Dental Department and School. Ludlow Strangways Hounsell, Guy's Hospital, Dental Department and School. Charles Heygate Knowles, Guy's Hospital, Dental Department and School. Godfrey Naish, Guy's Hospital, Dental Department and School. Graham Scales Simpson, Guy's Hospital, Dental Department and School.

Charles Frederick Anderson, University College, Royal Infirmary and Dental Hospital, Liverpool. Jonathan Harrison Anderson, University College, Royal Infirmary and Dental Hospital, Liverpool. George Herbert Harding, University College, Royal Infirmary and Dental Hospital, Liverpool. Arthur Edward Harrison, University College, Royal Infirmary and Dental Hospital, Liverpool. John Joseph James, University College, Royal Infirmary and Dental Hospital, Liverpool. Bernard Smith, University College, Royal Infirmary and Dental Hospital, Liverpool. Sidney Smith, University College, Royal Infirmary and Dental Hospital, Liverpool.

Alfred Reginald Halliday, Charing Cross and the National Dental Hospital. Francis Henry Pearse, Middlesex and the National Dental Hospital. Charles Brooking Phillips, Middlesex and the National Dental Hospital. Thomas Cadarn Reece, Middlesex and the National Dental Hospital. Arthur Ernest Ralph, Middlesex and the National Dental Hospital. Ernest Alfred Wheeler, Middlesex and the National Dental Hospital. Donald Amphlett, Mason's College, Queen's and General Hospitals, and Dental Hospital, Birmingham. George Frederick Cole Matthews, Mason College, Queen's and General Hospitals, and Dental Hospital, Birmingham.

Charles Burkitt Dalby, Owen's College, Royal Infirmary and Victoria Dental Hospital, Manchester. John Stephenson, Owen's College, Royal Infirmary and Victoria Dental Hospital, Manchester. Twenty-nine gentlemen were referred back to their professional studies for three months.

MR. G. J. WARDILL sends us the following :—As a quick and ready help in amalgam filling, I have found nothing to in any way equal strips of thin photographic celluloid film. They are perfectly transparent—which allows of the filling being visible during process —very thin and tough, and possessed of a sharp thin edge, which will cut through and trim off plastic amalgam perfectly to the contour of the tooth ; and when used in the same manner as a polishing-strip on a soft amalgam filling, will save a good deal of time. A piece held round a tooth and filling with the finger and thumb, and the celluloid rubbed on to the surface of the amalgam with a burnisher, leaves a beautiful surface, the celluloid, having a very highly-burnished surface, which is reproduced on the filling. It is most useful in approximal work, not accessible with a spatula, for trimming up, &c. They are also very serviceable, touched with vaseline, for moulding down an osteo filling, or, damped with chloroform, for a guttapercha stopping. The thicker varieties of celluloid films are useful for matrices, which are easily made by tying the material round the teeth. Either kind may be used as capping material by dipping small pieces cut out with rubber-dam punch into collodium or mastic. The Dental Manufacturing Company, Limited, at my suggestion, are placing on the market the celluloid cut into convenient strips, and, when they have once been used, the advantages are so obvious that they will almost certainly occupy a regular place in the busy man's office.

C. EDMUND KELLS, of New Orleans, writes, in the *Items of Interest*:—"A very convenient little trick is the following. On the bracket-arms two electric wires are tied to two small insulated brass posts. To light the annealing lamp, a small metal brush is first dipped into alcohol contained in a small inkstand always on the bracket-table, and then wiped across these electric terminals ; the contact of the metal brush causes a spark, the spark lights the alcohol on the brush, which in turn becomes a torch by which the lamp is lighted. Thus, in two seconds the lamp is lighted without the bother of matches and their attending nuisances."

Legal.

CAVENDISH *v.* THE AMERICAN DENTAL INSTITUTE.

In this action, before the Lord Chief Justice and a special jury, Mr. Richard Cotton Cavendish claimed damages from the American Dental Institute on the ground of the alleged negligence of one of their operators in attending on him and putting in certain artificial teeth. The defendants denied that there had been any negligence on the part of their operator.

Mr. Bigham, Q.C., and Mr. J. Eldon Bankes appeared for the plaintiff; and Mr. Dickens, Q.C., and Mr. Hohler were counsel for the defendants.

Mr. Bankes, in opening the case for the plaintiff, said that Mr. Cavendish had for some years suffered from his teeth, and in January, 1894, he consulted the defendants, the American Dental Institute. He went to the South Kensington branch in Thurloe-square, where he saw a Mr. M'Cormick, who examined him and told him that he could very soon put him all right at the charge of £5 a tooth. The plaintiff thereupon went every day to the establishment at Thurloe Square for a week, and was supplied with practically a new set of teeth in his upper jaw. The chief operation was the crowning of dead teeth, which was done by placing a crown of gold over the dead tooth. This was done and Mr. Cavendish's mouth became unbearably sore. He went down to Brighton, and when there two of these new teeth mysteriously disappeared. He thereupon went to the Brighton branch of the American Dental Institute, but there they told him that as he had been attended at the South Kensington branch he must go back there. So he went back and saw Mr. M'Cormick again, who said that the fault had not been his, but that the work of his workmen had been bad. From this time Mr. Cavendish suffered terribly from abscesses in the mouth, and his health was seriously affected. He had then to consult his medical adviser, Dr. Glanville, who found him suffering from indigestion and sleeplessness. Subsequently Mr. Cavendish went to another dentist, Dr. Boswell, who took out the plate which had been put in by Mr. M'Cormick, and substituted a fresh one and readjusted the teeth, and from that time Mr. Cavendish suffered no more pain or discomfort. The fact was that Mr. M'Cormick had done his work disgracefully, and Dr. Boswell did it thoroughly well. Mr. Cavendish had been charged 60 guineas by Mr. M'Cormick, and that money had been completely thrown away. Mr. Bankes went on to tell the jury the defects which were found in Mr. Cavendish's teeth, and the mischief which had ensued. He should call a number of distinguished dental surgeons, and they would say that Mr. Cavendish's teeth had been subjected to improper treatment.

Mr. RICHARD COTTON CAVENDISH said he resided at 4, Down Street, Piccadilly, and had been in the Army. In January, 1894, he went to the Thurloe Square branch of the defendant company. At that time his teeth were disfigured and broken off in front. He saw Mr. M'Cormick, who said that he must put in new teeth on the top of the old ones, and he told him he would never suffer from toothache again. He first broke off two of the front teeth, and witness attended every day for a week, and a plate or bridge was made and fixed in his mouth. Witness paid £60, and then a few day afterwards went down to Brighton. While there, on waking up one morning, he discovered three front teeth were missing. The plate was fastened into his mouth so that it could not be taken out. Witness at once went to the Brighton branch of the American Dental Institute, and they advised him to go back to Mr. M'Cormick. That was about a fortnight after the teeth had been put in. Mr. M'Cormick removed the plate and accounted for what had happened by saying he could not get his work properly done downstairs. Witness had the plate refixed and then his mouth began to get sore again, and he could not eat or masticate his food. Mr. M'Cormick lanced his mouth and subsequently told him to go to his doctor. The teeth never remained firm. In the summer of 1894 the plate broke in two in the plaintiff's mouth, and it caused him great pain. He went to Mr. M'Cormick, who again put this down to the bad workmanship downstairs. Mr. M'Cormick mended the old plate and put it back again. After this, however, witness suffered the same inconvenience he had suffered before. His health became bad, and he could not take any solid food. In consequence he had to go to see his doctor, and subsequently he went to Dr. Boswell, who was also an American dentist, and he removed the plate, which gave him great relief. This was in March, 1896, and a fresh plate was put in by Dr. Boswell which witness still kept in. He

He paid Dr. Boswell 60 guineas, and had suffered no pain or inconvenience since. Exactly the same kind of plate was put in by Dr. Boswell.

Cross-examined by Mr. Dickens.—Witness had been to several dentists during the last few years. His wife did not tell Mr. M'Cormick that he was in the habit of gnashing his teeth. When the plate broke in two Mr. M'Cormick put right what he complained of, and did not send in another account. He did not go to any other dentist till 1896. He denied that he was subject to fits.

Dr. Glanville said he had attended the plaintiff for the last 18 years, and he was a man of fairly good health. In January, 1894, he complained of his teeth, and said he had been to the Dental Institute and had a plate put in. Witness prescribed a wash for his mouth. Subsequently he suffered from indigestion and gumboils, and witness had to lance his mouth. Witness sent him back to his dentist, and in October, 1895, witness found him suffering very much from his mouth, and his general health was bad owing to his teeth. There were some indications in Mr. Cavendish's state on one occasion that he might have had a fit, but during the whole time he had known him he had never been aware of his having had one. Since he had been attended by Dr. Boswell he had been in perfect health.

Cross-examined.—Witness certainly did not tell Mr. M'Cormick that the plaintiff was subject to fits, or that he clenched his teeth.

By the Lord Chief Justice.—He found no further symptom to support the one which he observed, and which might have indicated that plaintiff had had a fit.

Cross-examination (continued).—The conclusion he drew was that the symptom he observed was caused by the irritation of the teeth.

Mr. Tomes, M.R.C.S., F.R.S., a consulting dentist, of Cavendish-square, said he had examined the plaintiff's mouth and the plate which had been originally put in. He was of opinion it was a bad piece of work and the teeth had been put in in a slovenly way. The witness described how, in his opinion, each tooth ought to have been treated. He was of opinion that the proper measures were not taken. The plate was too thin, and the workmanship bad or ill-judged, considering the strain that would be brought to bear on it.

Cross-examined.—Bridge work was done by English dentists, but not so largely as in America. If the operator did not see or was not told of the gumboils he would not have detected that the tooth was dead. He did not observe on the plate any signs of unusual friction, but if a man gnashed his teeth it would be more liable to accident.

Mr. SMALE, another dentist of Cavendish-square, also gave his opinion that the bridge was not a well-made one. He agreed that if the teeth were dead at the time of the operation they should have been drilled and the roots filled up.

Cross-examined.—If the teeth were alive at the time Mr. M'Cormick operated he did all that was right. He thought, in the first instance, all that was necessary might have been done.

Dr. PACKE, a doctor of the Medical Faculty of New York, practising in Harley-street, said he had examined the bridge work and considered it a very bad piece of work, because it was too slight to stand the ordinary strains which would naturally come on it. It caused a pressure on the front teeth and he thought a condition of inflammation would be set up, and the front teeth might be broken off. The price charged, £5 a tooth, ought to have commanded a good job.

Cross-examined.—His opinion was that the cap ought to have been four times as thick as it was, in spite of the fact that plaintiff had worn it from 1894 to 1896.

Mr. DICKENS then opened the case for the defendants and pointed out that, though after the way Dr. Boswell had acted he was not surprised his friend had not called him, still it was a remarkable thing that he wrote disapproving of this action, and offering information to the defendants which might be of value. The Dental Institute had previously had litigation with Dr. Boswell and had obtained an injunction against him. Boswell was not a witness whom the defendants could call, but it certainly was remarkable that he should have written this letter. The evidence which had been given by the dental surgeons in this case negatived the suggestion that there had been any inferior work. Counsel contended that the accident to this gentleman's teeth was caused by his habit of grinding them. He also pointed out that the particulars of negligence alleged were that the teeth were badly made and did not fit, that the gold used was of inferior quality, and that there were holes in the plate. Of these defects there was no evidence, except as to the latter point, and it appeared the holes had been made subsequently to the plate having been put in.

Dr. M'CORMICK was called, and, in reply to Mr. Hohler, said he was practising at Thurloe-square as a dentist, assistant to the American Dental Institute. He was a doctor of dental surgery of the University of New York, and had been in practice six years. He was consulted by the plaintiff, and advised bridge work and other steps to be taken. At the time witness examined his teeth the two which had been referred to were alive. Witness related the various times he had capped different teeth, and he fixed the bridge on the 26th of January, and it fitted the plaintiff's mouth. Witness was unable to use thicker gold on account of the closeness of the bite. In his opinion the thickness used was sufficient. Witness saw plaintiff again on the 2nd of March, when he said that, while at Brighton, he had found two front teeth gone when he woke in the morning, and he supposed he had swallowed them. Plaintiff further said that he was a living wonder, and that he had been seen by all the most eminent doctors in Europe, and none of them understood his case. Witness on this occasion made new crowns for several teeth, and took out the bridge to remake it. The bridge was very much crushed, and in one place was bitten right through the gold. He saw nothing in the two teeth which led him to believe that they were dead, and the plaintiff did not ever complain of having suffered from gumboils at any of the interviews. The only complaint he once made was that everything tasted sweet to him. He saw Dr. Glanville in 1895, who said he thought witness had done wonders for the plaintiff, who was subject to fits. When plaintiff first came to witness his teeth were broken in such a way as could only have been caused by an accident or grinding of the teeth. There were no holes in the teeth which he put in except in one.

Cross-examined by Mr. BANKES.—Witness had been in sole charge at the Kensington branch in the absence of any director. It did not occur to witness that the plaintiff's mouth was a class of mouth which required an extra strong bridge. He understood that when Dr. Boswell put in his bridge two of the teeth were dead teeth, and therefore he could use thicker gold. When witness operated those teeth were alive. He had never lanced any gumboils for Mr. Cavendish, and that gentleman made no complaint about having lost the teeth, but merely informed witness of the fact. Although he considered the bridge had been subjected to unfair treatment he was ready to replace it without any further charge. The bridge was in fact, broken in two. His assistant (Miss Taylor) was present at most the interviews with the plaintiff. Witness did not recollect ever having told the plaintiff that it was no use his coming complaining to him, but that he ought to go and see a doctor.

Miss TAYLOR, Dr. M'Cormick's assistant, said that his account of what had passed at the interviews with the plaintiff when witness was present was correct.

ARTHUR STILL, mechanical dentist, in the employ of the defendants, said that he made the bridge work in question, and had previously made others of the same thickness.

Cross-examined.—Generally the bridges were made of thicker gold.

Dr. RUBY CLIFFORD, managing director of the defendant company, and member of the Dental Institute in New York, said he had had great experience of bridge work. He considered this bridge to be a very good piece of work. If the teeth were dead one could put more gold in than if they were alive.

Cross-examined.—The defendant's business practically belonged to himself and his family. It would have been possible to kill the living tooth, but it would be wrong practice to do it.

By the LORD CHIEF JUSTICE.—Witness could give no explanation why in the plaintiff's case the treatment had not proved successful.

Mr. ISIDORE CLIFFORD, a licentiate of dental surgery of the Royal College of Surgeons, and a director of the defendant company, also gave evidence agreeing with that of his brother, the last witness.

Further evidence was given by Dr. Meadows, a licentiate of dental surgery, of Toronto and Philadelphia, and this closed the defendant's case.

The Court then adjourned.

On Thursday, January 21st, the plaintiff, Mr. CAVENDISH, was recalled, and, in reply to Mr. Bankes, denied that he had told Dr. M'Cormick, as that gentleman had alleged in his evidence, that he was a living wonder, or that he had been seen by all the most eminent doctors in Europe.

By Mr. DICKENS, Q.C.—Witness had seen various doctors and dentists.

By the LORD CHIEF JUSTICE.—Witness had served six years in the Army in India.

This closed the evidence, and, counsel on either side having addressed the jury, The LORD CHIEF JUSTICE summed up, and, after reading through the important parts of the evidence which had been given and having carefully reviewed it, told the jury that the plaintiff could only make out his case if he satisfied them that the defendants had been wanting in some duty to him by failing to use reasonable skill and care in the measures they took for his treatment.

In the result,

The jury found a verdict for the plaintiff, and assessed the damages at £150.

Judgment was given accordingly.—*The Times.*

PROSECUTIONS AT BRIGHTON.

At the Brighton Police Court, on January 20th, before the Stipendiary and other magistrates, Moss Harris, of Western Road; A. Ferguson, of 12, East Street; E. P. Day, of 15, Old Steine; M. D. Dingian, of the American Dental Institute, 123, King's Road; H. J. Barker, of 18, Trafalgar Street; E. S. Foley, of 89, King's Road; and E. Woods Oxborrow, of the Anglo-American Dental Company, 114, Queen's Road, were severally summoned for using the title of "Dentist," and representing themselves as qualified in dentistry contrary to the provisions of the Dentists Act, 1878. All the defendants pleaded not guilty.

Mr. R. E. Moore, barrister, prosecuted (instructed by Messrs. Blaber and Watson, Great Castle Street, London, W.). Mr. Purcell, Barrister (instructed by Messrs. F. Richardson and Sadler) appeared for Mr. Dingian ; Mr. Clydesdale, Barrister, appeared for Mr. Harris ; Mr. Treacher appeared for Mr. Foley ; Mr. H. Prince for Mr. Day ; Mr. Holmes for Mr. Barker, and Mr. Buckwell for Mr. Ferguson.

The case against Mr. Harris was first taken, and Mr. Moore, in some general observations, explained the provisions of the Dentists Act, providing that unregistered persons should not be entitled to take and use the name, or title, or addition of dentist, or represent themselves as persons specially qualified to practice dentistry. He explained that there was an exception in the case of persons not ordinarily resident in the United Kingdom, who held a qualification under which they might practice in a foreign country or British possession, provided he did not represent himself as qualified under the Act. This exception, however, he contended, it was for the defendants to prove if they could. He put in the register with the view of showing that Mr. Harris's name was not on it

Mr. CLYDESDALE said he would admit that.

FRED ROBERT BALDRY, of 52, Lillington Street, Pimlico, a private inquiry agent, said on December 23rd he visited defendant's premises in Western Road, accompanied by Henry Kemp. There was a case outside the house with the words "Gold medallist," and "English and American Teeth Company; single tooth 2s 6d." On the window was the words "Gold diplomist." They rang the bell and were shown into the front room on the ground floor, where they saw the defendant. He asked defendant if he was Mr. Harris, the dentist, and he replied "Yes." Witness asked him to examine his mouth, and he did so, and said the back teeth wanted taking out, and new ones put in. Witness asked what the price would be, and defendant replied that he could do it at any price (laughter). Witness said he wanted the work done well, and defendant then mentioned one guinea to five guineas. Witness arranged, if he had the work done, to pay three guineas, and defendant stated that for that sum he would do them well. Defendant also told Kemp he ought to have some teeth made but Kemp declined until the teeth were made for witness. Witness gave the name of Whiteley. An arrangement was made for witness to return and have the stumps drawn. Defendant gave witness a circular.

Mr. MOORE read this circular, which was headed "Highest award, gold medal," and described artificial teeth as "formerly the luxury of the rich; now a comfort of life within the reach of the poorest." Mr. Harris was stated to be a specialist in the American gum work.

Witness, in further examination, said he asked defendant if he was a qualified dentist, and he replied "Yes."

Cross-examined by Mr. Clydesdale: This was his first experience among dentists in Brighton. He was specially instructed to go to Mr. Harris. He denied that Mr. Harris said "I am not a dentist." Mr. Harris did not hand him a business card. Kemp was also in the employ of the Detective Agency.

GEORGE WOODS, of 21, Ethel Road, Fulham, private enquiry agent, said on January 4th he went with Miss Alice Watts to the defendant's premises in Western Road. He saw outside a case of teeth with the words "Harris, dentist," on it. In one of the windows there was a working model of moving teeth (laughter), and below these were the words "English and American dentist." Witness rang the bell and saw Mr. Harris. Witness asked him if he was Mr. Harris' the dentist, and defendant replied "Yes." Witness went into the surgery with Miss Watts, who consulted defendant about her teeth. Defendant told her she wanted two new teeth, and that he would do it for a guinea, and that stopping would be 7s. 6d. He then came down to 5s. for stopping, and 15s. for the teeth, and finally to both for 15s. (laughter). A deposit was paid, and an impression taken. Defendant afterwards offered to make a set for witness for 47s., or a better quality for £3 3s., a set that would last him a life time, and that he would crack nuts with (laughter). Witness consented, and defendant took an impression.

The STIPENDIARY: I suppose it is admitted he practiced as a dentist.

Mr. CLYDESDALE: I do not deny he practiced the mechanical part of the work, but not surgeon-dentistry. In his card he describes himself as a manufacturer of artificial teeth. I shall contend he never held himself out as a dentist.

Witness, continuing, said defendant asked for £1 1s. deposit. Witness offered 2s. 6d., and defendant said "Well, make it even money" (laughter). He accordingly paid 3s. On his leaving defendant said he had had a hundred patients that day, and that he was the first who had asked for a receipt.

Cross-examined, defendant was not described as a dentist on the receipt.

ELIZA ALICE WATTS, of 57, Alderney Street, Pimlico, generally corroborated the last witness as to the visit to Mr. Harris's premises on January 4th.

For the defence Mr. Clydesdale called Mr. H. L. Goodman, dentist, who said he had known defendant for 26 years; during 22 years of which he had practiced dentistry.

The STIPENDIARY: Then surely it cannot be contended he did not practice dentistry.

Mr. CLYDESDALE said he was unable to deny that there had been a technical offence. His point was, however, that defendant was engaged in the manufacture of artificial teeth before the Act, and that he had never held himself out as a dentist within the meaning of the Act. He stated that there was a case now in the High Court in which a number of dentists who were practising at the time of the Act, including Mr. Harris, were claiming to be placed on the register, and urged that a prosecution while this action was pending, was a harsh act. He asked that the case might be postponed until the High Court had decided whether these persons were entitled to be placed on the register.

Mr. MOORE said that in view of the facts that had been mentioned, of which he had been unaware, he would not press for more than a nominal penalty. If the circumstances mentioned were correct defendant had been entitled at the passing of the Act to be placed on the register, and why he had neglected to take a advantage of the opportunity he could not conceive. He asked for a nominal penalty in order that the fact might be made known that unregistered persons might not practice as dentists.

The STIPENDIARY said he thought it preferable that the case should be adjourned until the hearing of the action in the High Court.

The case was accordingly adjourned for eight weeks.

The summons against Mr. Foley was next taken, and FREDERICK ROBERT BALDING was again called. He said on December 22nd he went with Mr. Kemp to 89, King's Road, Brighton. The words "Foley, surgeon dentist" appeared outside the house; also on the balcony the words "Foley, American dentist." The door was opened by a woman, and he made an appointment to come another day.

Miss WATTS said on January 6th, she went to the premises with Woods. She deposed to seeing the words "Foley, dentist," on the windows of the third floor. Over the bell were the words "Dentist bell." She made an appointment to go on January 8th, and then, on the second visit saw a gentleman, not the defendant, who stopped her tooth.

GEORGE WOODS corroborated the last witness as to the visit to the premises on January 8th.

Mr. TREACHER, for the defendant, said the name was on the register. He pointed it out to Mr. Moore, "Samuel Foley."

Mr. MOORE said he was instructed the defendant was not the man.

Mr. TREACHER said defendant had lately opened the branch on the King's Road, and this would account for the address being different.

Mr. Moore—Then I must admit this case has gone (laughter).

The summons was dismissed with costs.

The summons against Mr. Dinjian was next taken. Mr. Moore, in opening the case, said the circumstances were different in this instance. The defendant was in the employ of the American Dental Institute, Limited, whose Brighton Branch was 123, King's Road, Brighton. The matter was somewhat complicated by the operation of the Companies Act, but he would rely on evidence showing that defendant held himself out as a dentist.

He called Frederick Robert Balding, who deposed that on December 23nd he accompanied Mr. Kemp to 123, King's Road, where he saw defendant. He asked defendant if he was Dr. Dinjian, the dentist, and the defendant replied "Yes, I am the manager." Defendant examined his mouth and gave him advice.

George Woods was called, and deposed that on January 6th he went with Miss Watts to the premises where he saw Dr. Dinjian the defendant. He asked defendant if he was a dentist and he replied "Yes."

For the defence Mr Purcell contended that there was not sufficient evidence of the use of a designation implying that defendant was specially qualified.

He called Mr. Clifford, one of the Directors of the Company, who stated that the Directors and Shareholders of the Company numbered seven, all of whom were registered dentists. They had a registered dentist in their employ at every branch. Mr. Dinjian was a graduate of Maryland University and a prize man for dentistry. He was a dentist of skill and experience.

The Stipendiary dismissed the case, on the ground that the evidence of holding out a qualification was not sufficient to justify a conviction.

The remaining cases were then adjourned for a week.—*Sussex Daily News.*

On Tuesday, January 23rd, the remaining cases were taken. Mr. Marshall Hall appeared with Mr. R. E. Moore. The other counsel were as in the previous week.

The case against Mr. Day was taken first.

Mr. Marshall Hall said the case was much the same as those already heard. Visits were paid to Dr. Day and arrangements made for the drawing and supplying of teeth. One witness actually had a stump extracted.

The STIPENDIARY: Out of devotion to his employers?—Laughter.

Mr. MARSHALL HALL did not know about that. He proceeded to state that to convict the defendant it must be proved that he implied he was registered or that he was a person specially qualified to practice dentistry. He called

HENRY KEMP, private enquiry agent, 21, Martindale Road Balham, who said on December 23rd he went with Frederick Baldry to 15, Old Steine. There was a brass plate on the door, with "Dr. Day, of Philadelphia, U.S.A.," and just inside the door was the London address, 9, Charles Street, St. James's Square. He rang the bell, and a woman answered the door. Witness and his companion were shown upstairs to a small room, and the woman made an appointment for them to see Dr. Day next day. Witness gave the name of "Whitley." On the next day, in pursuance of this, witness and Baldry went to the place, and were shown into a well-furnished front room. Eventually they were shown into a small room, where Dr. Day was waiting. Witness asked "Are you Dr. Day, the dentist?" He said "Yes." Witness told him he wanted his nephew's teeth attended to, meaning Baldry. The latter sat in a surgical chair, and his mouth was examined. Dr. Day said some of the stumps ought to come out and said he would do the work and supply false teeth from £1 1s. upwards. They agreed to pay £6 6s., which would include gas. Witness then said "I suppose you are a qualified dentist? He replied "Oh, yes." While Baldry was in the chair one stump was taken out. A further appointment was made for Monday, December 28th, and five shillings deposit was paid. Dr. Day told witness he ought to have new teeth. He replied that he could eat his food all right, and Dr. Day said "See how much better you could eat if you had new teeth." He said he would see how his nephew's false teeth were.

Cross-examined by Mr. PURCELL he said he took notes of the cases. He signed his notes, as did also Baldry. He and Baldry wrote their notes in the street after leaving the houses. He was employed by Squire White, a private detective, of London, who, he believed, received his instructions from Mr. W. H. Blaber, the solicitor for the prosecution, but his principal master was Mr. Kendal.

George Woods, private enquiry agent, of 21, Epple Road, Fulham, said on January 5th he went with Miss Alice Watts to 15, Old Steine, and was shown into a consulting room. He saw defendant, who twice during the visit said he was Dr. Day, the dentist. Miss Watts told him she wanted something done to her teeth. Dr. Day said he could stop a tooth for £1 1s. She complained of the price, but he said he did nothing but the best work. Dr. Day made an appointment for the 12th January with Miss Watts. In the course of the interview witness said to Dr. Day, "Of course you are a qualified dentist and will do your work well?" He replied, "Oh, yes, certainly."

In cross-examination he said he took notes. He refused to hand them to Mr. Purcell.

Frederick Robert Baldry, private enquiry agent, of 52, Lillington Street, Pimlico, corroborated Kemp's evidence as to the visit on December 23rd. He signed Kemp's notes as correct.

For the defence Mr. Purcell said the case depended upon the trustworthiness of the witnesses. Fortunately for Dr. Day he was not dependent upon his own denial of the statements to disprove the evidence. Dr. Day was undoubtedly a qualified man, having won his degree after two years' study at Philadelphia, and had been practising since 1878. He had been ten years in England, partly in Chester, with a registered dentist. He was aware of his legal, or illegal, position, and had always been careful to observe the law. He denied that he was a dentist or implied that he was registered.

Mrs. Bertha London, wife of George London, a watchmaker, housekeeper to Dr. Day, was called, and said she opened the door to Baldry and Kemp and showed them upstairs twice. One of them on one occasion asked Dr. Day, "are you the dentist." He said "No, I am Dr. Day." Witness had been housekeeper for four years.

Cross-examined by Mr. Hall, witness said Dr. Day had not a large practice. He was often in London, Mr. Foster being left in charge in his absence.

Mr. Purcell: Mr. Foster is a registered dentist.

Mr. John Richard Tyndale, solicitor, Essex Street, Strand, said he had known Dr. Day ten or twelve years. From time to time he had consulted him as to his legal position. He was a man of considerable skill and ability.

In cross-examination witness warned him that if he held himself out as a dentist he would be acting illegally. He tried to register Dr. Day but failed, the Philadelphian degree being no qualification.

Re-examined, he said the reasons for the failure was that the Philadelphia College did not respond to the Medical Council in London when the invitation was sent in 1888. Only two colleges in America did respond.

Mr. EDWARD GEORGE FOSTER, practising with Dr. Day, at 15, Old Steine, said he was a registered dentist.

Cross-examined he said he paid himself for his registration. He had no qualification as a dentist when registered in 1878. He was the "Edward Foster" who appeared on the register.

Mr. PURCELL said no qualification was required in 1878, the fact that a man was practising being sufficient.

Cross-examination continued, he said he had a diploma now. His name was not on the door at 15, Old Steine. He and Dr. Day had an agreement. He always practised at Old Steine.

Mr. HALL: I suggest you are "covering" Dr. Day.

WITNESS: Nothing of the kind. He shared profits with Dr. Day.

The STIPENDIARY said he had no reason to doubt the evidence of three witnesses for the prosecution. He should be surprised if they had committed wilful perjury, because there was no worse kind of perjury than that committed by informers. There was nothing in the evidence to make him come to such a conclusion. It was plausible, consistent, and clear. It had not been contradicted in any material point by Mrs. London. As to the other two witnesses, he did not think they threw any light upon it. He thought Dr. Day held himself out as being a dentist, and there must be a conviction. He, however, took into consideration what had been said as to his competency, because the highest possible penalty would be properly imposed upon a mere charlatan who had no qualifications.

Mr. MARSHALL HALL said it was with reluctance that the proceedings were taken in this case because Dr. Day was a skilful practitioner.—(Applause in court, which the Stipendiary instantly stopped.)

The STIPENDIARY said the law must be enforced, and imposed a fine of £10 and £3 13s. 6d. costs, or 21 days' imprisonment with hard labour.

The case against A. Ferguson (*alias* Cutler), 12, East Street, was then taken. Mr. Purcell again appeared, instructed by Mr. Buckwell, solicitor.

Mr. MARSHALL HALL said this was a bad case, as the element of skill present in Dr. Day's case was woefully wanting in this case. He was carrying on business under an alias and was absolutely incompetent, not having even attempted to pass his Preliminary examination.

HENRY KEMP was again called. He said on December 23rd he went with Baldry to 12, East Street. On the ground floor is a hairdresser's, Cutler and Co. Above the shop were some rooms kept by the defendant, and outside the door was a show case of artificial teeth and testimonials. There was an inscription "Mr. Ferguson, of New York," on the door and facia. He asked for Mr. Ferguson and was introduded to the defendant. Witness said he wished to consult him about his nephew's teeth, and was shown into a surgery. Ferguson said the stumps wanted taking out and his whole mouth was in a bad state. He said he could take them out without pain and could provide new teeth for any sum from £1 1s. He guaranteed them for a number of years. An appointment was made for the following Monday, and Ferguson gave him a circular with numerous testimonials. Witness gave the name of "Whitely." He was sent there to get evidence, and during the conversation witness asked "Are you a qualified dentist?" and he replied "Yes."

GEORGE WOODS deposed to paying a visit to 12, East Street on January 5th with Miss Watts. He saw Ferguson and asked him if he was "the dentist." He said "yes," and examined witness's teeth. He said they wanted taking out, and wished to take one out that night, to show how painless his process was. He said he could make sets of teeth for from £2 2s. to £5 5s. He said he would have the £5 5s. set and a mould of his mouth was taken. He paid 2s. 6d. on account and made an appointment for a later visit. He said it was impossible to do a set for £1 1s. and he had sacked several men in London for taking orders of £1 1s. while he was with Mr. Goodman in London.

FREDERICK ROBERT BALDRY corroborated Kemp's evidence as to the visit on December 23rd.

FREDERICK WALTER MOORE, qualified dentist, practising at 39, Preston Road, who attended on subpœna, said he knew Mr.

Augustus Cutler, the present defendant, calling himself "Mr. Ferguson, of New York." He was articled to him as an apprentice. He was with him three years and acquired some knowledge of dentistry. He was a fairly decent pupil. He went to Mr. Goodman, Ludgate Hill, from witness. Defendant's name was Cutler, and he had not to his knowledge been to New York. He was not aware that defendant had passed his Preliminary examination at any time.

Cross-examined, witness said defendant was apprenticed in 1887. He had not seen much of him since.

Mr. PURCELL, for the defence, said there was nothing upon the premises which amounted to calling himself a dentist or implying that he was registered. One would expect in the case something outside of the premises to confirm the statement. The circulars were a mere declaration that the man was practising dentistry. He asked the Stipendiary not to act upon the testimony of the witnesses, not because they were perjuring themselves, but because their evidence was not good enough. He stated that he was instructed to call three witnesses as to the credibility of the witnesses for the prosecution.

The STIPENDIARY said he did not know how that could be admissible. He might be able to call all England to give evidence of that kind.

Mr. MARSHALL HALL said that in a recent case he asked a solicitor's clerk whether he was believed when he made a statement and this almost sent Sir Frank Lockwood into a fit.

After some legal discussion, Mr. Purcell said he would not persist in tendering the witnesses He called

Mr. DAVID THORBURN, M.D., of 17, Ship Street, Brighton, who has rooms at 12, East Street, who said he had known defendant about a year, during which he had practised dentistry. He was one of the most skilful practitioners he knew.

Cross-examined : Defendant had not passed any of his examinations.

The STIPENDIARY said that if the business circular did not hold the defendant out to be a qualified dentist nothing could. He would have to pay the same fine as before, £10 and £3 13s. 6d. costs, or 21 days imprisonment with hard labour.

In the case against E. Woods Oxborrow, Mr. Marshall Hall said that defendant's solicitor was unable to contest the case. He was not surprised, because he actually called himself a registered practitioner, and the word "Dentist" appeared over the door, as well as the word "registered." He was a young man, and he had taken the wise course of admitting his offence he did not press the case.

Mr. TICKLE, on behalf of the defendant, said his client had not practised dentistry in ignorance. He was well qualified and took the business over from a man named Robinson six years ago, who was a registered dentist, and who was responsible for the word registered.

A fine of 40s. and £1 1s. costs was imposed, with the alternative of 14 days' hard labour, and Mr. Tickle gave and undertaking that the words complained of should be removed.

The last case was that against H. J. Barker, who also pleaded guilty. Mr. Hall said over the shop in Trafalgar Street was an expensive facia ordered by the defendant's father who died before the bill was paid. He had therefore had not gone to the expense of having it removed. It had the words "J. Barker, registered dentist." A brass plate on the door had been taken down which had on it the words "H. J. Barker, Surgeon Dentist." Defendant's father died in 1892.

Mr. HOLMES, for the defendant, repeated this statement, and said defendant was not carrying on the practice of dentistry. He was selling drugs with his mother, and they were in poor circumstances. In answer to the Stipendiary, he said Mr. Barker's father had been dead five years. Mr. Marshall Hall added, however, that if the defendant had not pleaded guilty, the witnesses for the prosecution would have proved that Barker represented himself to be a qualified dentist and told them that he always gave great satisfaction to his customers with his sets of teeth.

The Stipendiary imposed the same penalty as before, 40s. and £1 1s. costs, or 14 days hard labour.—*Brighton Gazette.*

Review.

"DENTAL MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS," by CHARLES W. GLASSINGTON, M.R.C.S., L.D.S.Edin., Senior Dental Surgeon, Westminster Hospital, Dental Surgeon, National Dental Hospital, and Lecturer on Dental Materia Medica and Therapeutics to the College. London: J. & A. Churchill.

A contribution by a teacher of experience to an almost unoccupied field of dental literature in this country must be accorded an appreciative welcome. The American work by Dr. Gorgas, the first edition of which, in 1884, was of about the size and scope of the new treatise before us, while maintaining an unquestioned supremacy, has now grown (Fifth Ed., Philadelphia) to proportions beyond the limits of a student's handbook.

Mr. Glassington's book is invested with particular interest—if also, for the moment at least, with less importance—on account of the recent decision respecting the educational value of general materia medica in our curriculum. The question may possibly soon be reconsidered ; but the present position may be regarded as an acknowledgment of the irrelevancy of the instruction hitherto available.

It may be, and has been, contended that the pharmacal point of view is not the best approach for apprehending the clinical significance of remedies ; the more natural mnemonic order of association being linked with the routine teaching and study of practical surgery and medicine, as following the path of past experience in accumulating our recorded but still empirical results. It is indeed in the restricted sense of appertaining to the chemico-physical constitution of drugs that the term "Pharmacology" is exclusively used by continental writers, as distinguished from its English application to physiological research (more accurately connoted as Pharmacodynamics.) Be this as it may, however, it is well that the student should at some time be invited to a generalised survey of the weapons collected within his reach, and compare their more obvious possibilities ; though the science is a highly artificial one, and classificatory, until, perchance, we discern a therapeutic law.

Hence a handbook, as an index to more or less disconnected and unrelated facts, few of which can be tested but at the moment of peril, must be judged by a high standard, and as a work of reference, to be consulted in study and practice, for suggestion or warning. Now the essentials of a reference work are—in the order of their importance—firstly, scrupulous accuracy within practical limits ; secondly, reasonable completeness ; and, thirdly, convenient arrangement.

Applying these tests, as we must, even to a first edition by an inexperienced author, it will be convenient to do so in inverse order.

The general scheme of Mr. Glassington's book, following closely its predecessors, is that of a condensed, selected general materia medica, the special "Dental therapeutics" being appended to the usual description, "Pharmacology" and general therapeutics of each substance. The effect of this is, of course, to dilute the special character of the work by descriptions of the diseases for which the drug has systemic uses, while remedies not of special dental application, but which a practitioner wishing to employ for general medication might look for, are necessarily omitted. And even when the general uses of a drug named are "too numerous to mention" the plan breaks down again. For this reason, and for the sake of literary completeness and distinction, we much regret the absence of a bibliography, or even a select list of the best standard authorities for consultation. If anywhere, the student would look to his handbook for such guidance for those who may not enjoy access to a large library.

The triple classification into Inorganic, Synthetical and Organic substances is becoming inevitable since the breakdown on the bounds of the old dual division. Three separate lists, however, in the main body of the book, almost neutralise the convenience of alphabetic arrangement ; and although the distinction, if accurately observed, may be edifying, the student will be puzzled to find first upon the Inorganic list acetic acid from wood !

A wise discretion has been exercised in ignoring many ephemeral remedies still on trial in favour of space for better understood reliable ones, not many of which we think have been omitted. We are, however, somewhat surprised to find no notice of the uses or chief physiological effects of heat, cold, exercise, rest, massage, or electricity in any form.

A very useful feature would have been a concise chapter on the general subject of antisepsis, concerning which and the bactericidal power of various agents great misconception prevails. And in this connection we feel it a blot upon a book which should inculcate strictly professional traditions, that more or less secret proprietary preparations, such as "Listerine," are recommended, however excellent and expensive they may be, unless their full and exact formulæ can be given.

Also, the chemical formulæ generally correctly given, are unaccountably omitted for several important definite substances.

We should be glad to see some additional tables of solubilities, antidotes, incompatibles, conversion of weights, etc., and imagine that the present index and the posological table might be combined in one with advantage to frequent perusal. The prescriptions are written in English, which is well and seemly, but the very singular and not convincing reason given is that it is to prevent "printer's errors occurring"!

No data are given for the conversion or understanding of metric measure, which by a most regrettable "printer's error" is incorrectly described, and there are traces of some confusion between the B. P. and the U. S. P. fluid ounce. The general accuracy of statement and soundness of information in the book is unquestionable ; and with a reconsideration of some doubtful points of dosage and strength of solutions a very high standard should be easily attained in subsequent editions. Perhaps, for instance, it may be unnecessary and incautious in a work of the kind, even by way of illustration, to discuss the possibility of giving a child 30 minim doses of Liq. Arsenicalis for chorea.

The author dedicates his book to Dr. Allchin, and acknowledges indebtedness in its preparation to Dr. Murrell, and the works of Mitchell, Bruce and Phillips.

A separate chapter on general anæsthesia for dental operations, by Dr. Maughan, deals very ably and fully with the administration of nitrous oxide gas, alone or in combination with ether. The print and make up of the book are excellent, and its form very convenient and agreeable.

Our criticisms upon Mr. Glassington's promising venture into a realm bristling with difficulties and pitfalls, where none may claim infallibity, are to the intent that good may be made better, and his little book with confidence be consulted for concise and reliable information.

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Original Communications.

PROFESSOR PAUL'S PAPER.*

NOTES ON TUBULAR ENAMEL.

By CHARLES S. TOMES, F.R.S., ETC.

Dear Mr. Editor,

You invite me to express an opinion upon the views lately expressed by Dr. Paul.

So far as Nasmyth's membrane goes I entirely acquiesce in his view—that it is a calcification of a part of the enamel organ and not, as I used to think, a deposit of coronal cement.

Dr. Paul has been kind enough to lend me some of his sections and to give me lantern slides of them, which leave hardly a possibility of doubt, though I should be glad if he succeeds in demonstrating it, as he hopes to do, between the cement and the enamel in animals with coronal cement of material amount.

As to the other question, how the tubes get into the enamel in marsupials, you ask me for an opinion at an unfortunate moment. It so happens that I am just now preparing a paper upon the development and structure of tubular enamels generally. I have some sections of the enamel of fossil sharks which seem to lend support to this idea, that there is a penetration of the enamel by tracts of dentine matrix, and that the tubes travel in these tracts.

But I am not inclined to agree with him that this is the explanation of the tubes in tubular enamel generally; my investigations, not as yet quite complete, lead me to a general conclusion so far-reaching and so unexpected that I am not willing to express it as yet, but shall very shortly be in a position to do so.

Yours very truly,

CHARLES S. TOMES.

By J. HOWARD MUMMERY, M.R.C.S. L.D.S.

PROFESSOR PAUL, in his interesting paper, read before the Liverpool District Odontological Society in October last, endeavours to account for the formation of tubular enamel on a new hypothesis.

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* Published in our issue of November last.

He thinks it possible that portions of uncalcified dentine matrix thrust up between the enamel cells remain uncalcified and persist as spaces between the enamel prisms. This is a very tempting theory, as it gives a possible explanation of a condition which it has been very difficult to understand ; but it appears to me, that while Professor Paul's theory may account very satisfactorily for the club-shaped spaces so frequently seen in the enamel, at its junction with the dentine, it is somewhat difficult to understand how true tubular enamel can be arrived at in this way. I have many specimens in which these club-shaped spaces are seen to be crossing the prisms of the enamel at various angles ; but this is probably due to their being on a different horizontal plane, and lying either above or below the prisms, which they seem to cross—it certainly does not appear to be at all a rational theory that they should be spaces within the fibres of the enamel.

In the Sargus we find a tubular enamel in which the tubes are most open and abundant on the free surface of the enamel—these certainly appear, as Tomes says (*Dental Anatomy*, p. 24) : "Not to be continued out of, or derived from the dentine, but belonging to the enamel itself."

The first-formed portion of the enamel—that nearest the surface of the dentine—has few or no tubes, while the portion further from the dentine is penetrated with large tubes ; these tubes, then, must have been formed after the ameloblastic layer had been cut off from the dentine matrix by already formed enamel, and therefore, could hardly be due to prolongations of uncalcified dentine matrix.

In marsupial enamel, also, the tubes are frequently seen to turn sharply at a right angle, cutting across the long axis of the enamel prisms, and in specimens which Mr. Tomes has succeeded in decalcifying and separating, without disturbing their relations, these are seen to be absolutely continuous. It is, I think, a little difficult to reconcile any appearances we meet with in early tooth germs with the supposition that these long spaces or tubes are prolongations of the uncalcified dentine matrix ; but I have not had the opportunity of studying many early germs of marsupial teeth, and a more extended examination of these in a fresh condition might, of course, lead to a clear understanding of the origin of these tubes or spaces.

The occurrence of spaces in the enamel in human teeth is the exception, and they are rarely seen to penetrate to any great depth in the tissue; we should arrive, therefore, at the best corroboration of Professor Paul's view if it were found that prolongations of the uncalified dentine matrix between the enamel cells are the rule rather than the exception in the early germs of the teeth of those animals which have a true tubular dentine.

We shall look with great interest for further communications from Professor Paul on dental histology—the present paper is full of suggestion and stimulating to further investigation.

J. Howard Mummery.

February 17th, 1897.

PORCELAIN INLAY WORK.*

By William Dall.

Mr. President and Gentlemen,—The lantern demonstration that I have the pleasure to present to your consideration this evening is on Inlay Work, modern and ancient, the reparation of fractured teeth with porcelain and the inlaying of roots with gum coloured porcelain.

As I am particularly anxious to have your views on the latter subject, I trust you will criticise it freely and handle it roughly if need be; of course I am also anxious that you should criticise my methods of ordinary inlay work, &c., so that I may learn something this evening. I will endeavour to be as concise as possible, and do my best to make my demonstration interesting.

I have now practised inlay work for the last nine years, and I have still more confidence in recommending it to you. The methods I then adopted, with one or two exceptions, I still practise, although large strides have been made in the making of inlay rods by Messrs. Ash which facilitates matters very much. I am glad to say inlay work has certainly advanced within the last few years in the dental profession, both at home and abroad. People are becoming more artistic, and we are more and more asked to keep the gold out of sight. Of course I should not like to affirm that inlay work in combination with gold is as good as an *all* gold filling, but certainly it is a good second, and in many cases quite equal, and from an artistic point of view it stands FIRST. With few exceptions inlay work is preferable to any other kind of filling where seen.

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* A Paper read before the Liverpool Odontological Society.

I wish to describe the treatment of both simple and compound cavities. My definition of a simple cavity will be, for to-night at least, "a cavity that can be completely filled with one piece of porcelain," for not only can inlays be inserted on the labial, buccal and coronal surfaces, but disto-labial and mesio-labial cavities may be filled. These two last mentioned cavities require special burrs, which I have had made and which I will show you. Simple cavities may be classed as regular and irregular. I keep my burs in a case in a definite order and marked to fit an inlay gauge so that much time may be saved.

With these few introductory remarks I will open my demonstration, and I shall be very glad to hear and answer any questions while the slide is on the screen.

There are three methods of inlaying a simple labial regular cavity with a piece of porcelain :—

1. By ground inlays cut from rods.
2. By inlays as sold by the depòts.
3. By round porcelain rods.

In filling a cavity by the first method it will be necessary to start by cleaning the surface of the tooth surrounding the cavity or disintegrated part, which you intend to fill, by passing over it a fine carborundum stone or paper disc, revolved in the engine. This is a very important point, for if you neglect it, when finishing, you may come upon some soft parts surrounding the inlay, and then there will be an uneven surface, and possibly not a perfect fit at that part. You will notice that the inlays are slightly tapered (referring to slide) use a sharp rose-head burr that will almost fill the cavity (here I would just mention that in cases of disintegration I invariably use a small carborundum point to get through the enamel and find it easier and better for both patient and dentist), your assistant may stand at the other side of the chair from you, with hot-air syringe for blowing away the dust made by the burr and a wire brush ready to free the burr of all *débris*. Now use a very much smaller burr to deepen the cavity at the edges, which cavity has been left somewhat concave. Select an inlay burr, I shall say A, but before commencing to use that burr, moisten the surface, by so doing you are not so liable to chip the edges of the enamel.

I once heard a dentist say that he stoned the edges, but I think that is well nigh impossible. Now, after you have made your cavity to the required depth, select an inlay, we shall say A, place a small quantity of creamy phosphate cement, I generally use B shade, carrying the inlay in your dressing forceps by the small knob, and when the inlay is "home" break off the knob by either tightening the forceps or giving it a slight tap with their handle ; harden the cement by the hot-air syringe, grind flush with the surface of the tooth, either with a carborundum or diamond point, smooth with water of ayr stone and polish with a buff and pumice. The finishing can be done at another sitting if found more convenient, but in that case it is well to varnish inlay and tooth.

To fill by the second method :—I will suppose that you have selected an inlay a little larger than your prepared cavity ; next fix it into an inlay carrier, with a little shellac, and having made it true in the engine hand-piece, you can reduce it in size, while making it perfectly round by revolving it rapidly on a diamond or carborundum disc, or you can use two engines as described by Mr. Richards, of Richmond, the one going to the right and the other to the left ; or you may use an engine with two cables, the photograph of which I have shown you, this answers admirably ; still another way of doing the same thing is to have a lathe with cable and hand-piece, which I have found very convenient. Some prefer to grind the inlay into the prepared cavity with diamond dust, but this, I think quite unnecessary and only a waste of time. The fixing with phosphate is the same as the previous method.

The third method is by round porcelain rods. Fix the rod into an inlay or rod carrier, make it round and to the size of the cavity, as I have already described, cut a narrow groove almost through it with a diamond disc above the depth of your cavity and fix in the ordinary manner.

In an oval cavity any of the three methods may be used, but the inlay has to be made oval of course instead of round. It is advisable to make a mark on both tooth and cavity, so that in fixing the inlay may be put in exactly the same position that it has been ground for.

If the inlay be made from a rod, and it is a little too big, you may enlarge your cavity or grind your inlay with a diamond disc, holding the inlay between the index finger and the thumb, or it may be held in a carrier.

In the case of an irregular cavity it may be easier to fit the porcelain to a model instead of to the cavity. An impression may be taken in by a piece of wax, in the form of a pencil, which is softened at one end and pressed into the cavity. The model is cast in either fine plaster or phosphate cement.

So much then for simple cavities ; but compound cavities require some different methods. In the case of an interstitial cavity in an incisor, the lingual part of the cavity is filled with gold and the inlay is then let in from the front, and is, of course, only for ornamentation. The gold has to be built up to the middle line, and if the cavity is deep I sometimes line it altogether with gold, so that there is scarcely a vulnerable point. After the inlay is fixed, the gold is burnised quite close to its edge that the line of cement may be completely covered, and I have little fear of the cement giving way on the labial surface.

Instead of gold in these cases amalgam may be used, if so, the inlay and the amalgam may be put in at the same time and polished afterwards, or the amalgam may be inserted with a temporary filling in place of the inlay, and the latter inserted at the next visit.

Porcelain Point.—In the case of a front tooth that has had the tip broken off, it is sometimes possible to make a very artistic point by cutting one from an artificial tooth—plate molars being perhaps the most useful. Two holes have to be drilled in the tooth to be repaired, corresponding in size and distance to the pins in the molar, the porcelain is then cut roughly into the shape required, fixed with phosphate, varnished at the joint and finished next day.

PRESIDENTIAL ADDRESS.

By Charles F. Rilot, L.R.C.P., M.R.C.S., L.D.S.*

Gentlemen,—I have been informed that I am expected to follow the custom of giving you a short address on this, the first occasion on which I occupy this chair, and, in the first place, I would beg to assure you that I esteem very highly the honour of being your President for the coming session. Every honour brings its corresponding responsibility, and, while I am grateful for the one, I am not unmindful of the other, and will do the utmost in my power to further the interests and uphold the reputation of our Society.

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* Delivered before the Students' Society, Dental Hospital of London.

Though I have not been able of recent years to attend your meetings, I can claim to have served a long apprenticeship in the past, for I was, I believe, the first curator of your museum some thirteen years ago, and after that held, for some years, the office of secretary, first of the society and afterwards of the council. I would now seek to direct your thoughts for a while to the progress of your studies during your hospital career, and if it be in my power would help you to make the most of the opportunities you now have for acquiring knowledge and experience. And, firstly, I would impress on you the necessity of continuous work, both in theory and practice. It is only by continued and repeated practice that our hands can acquire that deftness and dexterity which is requisite in dental surgery. We have not to learn to perform a certain number of definite operations; we are then merely human machines. We must train our hands to be so completely at the disposal of our wills that we can without effort adapt our operations to varying circumstances and conditions. So, too, with our theoretical studies. Our object here is not merely to acquire the requisite amount of knowledge to pass our qualifying examinations, but to study on the broader basis of training the mind and laying the foundations of that deeper knowledge which can only come after many years of study. How then can we best fulfil these objects? To take the practical side first, I have already spoken of the necessity of continuous work, and to this I would now add variety. Do not confine yourselves to one method of operating, or to one branch. By all means make yourselves efficient in one method before trying another, but do not be content with that one method; try everything, and you will then in the future be able to apply to each individual case that method or that operation which is best calculated to achieve the best results. Thirdly, I would dwell on the necessity for thoroughness, for without that your whole work will be a dismal failure. Genius is said to be nothing more than an infinite capacity for taking pains, and as your work becomes more painstaking and thorough, so will your success be more certain and secure. Fourthly, I would place the cultivation of the habit of observation. It has often seemed to me that our friend Sherlock Holmes, fantastic though he be, conveys to us a sound lesson on the value of observation and says to each one of us, keep your eyes open, find out the reasons, objects, or causes of things, and then store them up in your memory for future use.

When we come to theoretical studies we find again the necessity for continuous work. If you want to retain your knowledge you must acquire it slowly and by degrees, not trying to squeeze into three months that amount of reading that ought to have been spread over two years. There seems to be a great deal of misapprehension as to the value of lectures, and I have even heard it seriously stated that lectures are of no use whatever. In my opinion lectures are of the greatest value if properly attended. They are, of course, not meant to do away with the necessity of reading, but are a most valuable supplement thereto. In a good lecture information is conveyed to you in a form in which it is most easy to assimilate and retain it. Whereas I have spoken of lectures as being supplements to reading, so I consider note-taking to be a necessary supplement to both. You will find that if you write down carefully in the form of notes a condensed epitome of what you are reading, it will very considerably aid your memory, forming as it were a mental picture which is easily retained. So, too, with notes of lectures. I am very much against the practice of taking copious notes during the lecture. In your endeavour to write a great deal you are apt to lose the thread of the lecture and that personal view of the subject which constitutes the charm and advantage of all good lectures. I think the best plan is to make only a few notes at the time, and then, at home in the evening, to write out as fully as possible from memory all the leading points. Write your notes on one side only of your note book; then, when you go through them again, or read up the subject in your various text books, you can add any more notes required on the other side. Above all things get into the habit of writing your notes in a clear and concise manner, not jumbling them up, but keeping each branch and sub-division of your subject quite distinct; thus, in taking notes of a disease, have your causes, symptoms, treatment all clearly distinct and separate, and all the information under each heading tabulated so that you can see at a glance each cause or each separate symptom. By adopting such tabular method of note-taking you can commit your notes more easily to memory, you can recall them more readily on the spur of the moment, and—a matter of no small importance—you get into the habit of arranging your thoughts in such an orderly manner that, whether in writing papers or answering *viva voce* questions, you can express yourself in a clear and intelligible manner. Though I do not want to dwell on the subject of examinations, I would urge you all to take every opportunity of attending the class examinations. Though you cannot all get prizes or certificates the practice of writing papers will be of inestimable value to you when you are called on to display your knowledge at the examination hall. So many marks are lost through missing the point of a question, or wasting all the time on one answer and having to hurry the others, or confusing your answers so that no examiner can find out what you really mean, that you cannot have too much practice in writing papers. Nor can I leave the subject of examinations without again warning you against leaving your acquisition of knowledge till the last three months of your hospital career, and then depending on a skilful coach. If you have spent your time profitably and diligently all the preparation you ought to require for your examination will be a recalling and gathering together of those facts previously committed to memory. Your last three months should be entirely a period of revision, not of new learning.

I have so far omitted to say anything of this Society, but I would not have you think that it is not to be reckoned amongst the educational forces of your hospital career. On the contrary, I consider it of very great value, not so much perhaps from the point of view of examinations, but rather looking on the broader aspect of education. There is no one who has read a paper before the Society but will bear me out in saying that the preparation of a paper worthy of your acceptance is no small education in itself, and by concentrating one's attention on some special branch of study has often been the means of awakening a lifelong interest in that subject to the reader's own great benefit, and, maybe, to the benefit of the whole profession. So, too, by joining in the discussions we learn to arrange our thoughts in our own minds, and to express clearly whatever we wish to say, to discuss good naturedly for the determination of the truth, and not for the mere sake of opposition, and to speak to the point. Moreover, we learn to recognise the fact that there may be many ways of looking at the same thing, and that he who differs from us is not necessarily an idiot or a knave. I therefore trust that for your own good and our mutual benefit you will all endeavour to read papers or join in the discussions. It is not necessary that you should have some original theory to put forward or some new operation to recommend. Where the literature of a science is so extensive and world-wide as ours, it is impossible to keep pace with everything that is written on every possible subject ; he, therefore, who will take up some special subject and carefully compile all that has been well written thereon, both at home and abroad, will produce a paper well worthy of our acceptance, and productive, in all probability, of as good discussion as an original essay. Nor must I pass on without urging you to make your Casual Communications many and often. There is a saying, I believe, to the effect that the law does not concern itself with very little things, but here we do ; nothing is too trivial or insignificant to be worthy of notice, a curved or absorbed root, an unusual cusp, an excess or deficiency of parts may each convey a lesson to an observant student. Nor need we be afraid to air here our failures and our difficulties ; we are all students together, we all have our failures and our troubles, and we may both give and receive help by ventilating our various troubles and detailing our attempts to overcome them.

There are some amongst us who will soon be passing from our midst to take up their life's work and assume their places in the ranks of those who are fighting against disease and pain. To such I would say, that it is no easy and luxurious career which is opening before you, but one which demands the exercise of the highest gifts of conscientiousness, care, patience, and gentleness. You ask, and have a right to expect, your patients to place confidence in your skill and judgment. Guard very jealously then the trust that is reposed in you, see that the interests of your patients are ever foremost in your mind, and let no trouble on your part be too great which may conduce to their benefit and welfare. If you do this, you may rest assured that the richest reward of all will be yours, the consciousness of having done your duty.

A FEW POINTS IN THE PREPARATION OF ROOTS FOR FILLING.*

By W. Green, L.D.S.

Mr. President and Gentlemen,—This is a most interesting subject to all of us, and more especially to those who have met with the many difficulties which crop up, and cause us no little anxiety, as to the success of an operation of root filling.

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* A Paper read before the Students' Society of the Dental Hospital of London.

To obtain success we must pay special attention to—

1st. The exact position and number of roots we have to deal with.

2nd. The degree of septicity and calcification.

3rd. The advisability of enlarging the root canals, and the best method of so doing.

4th. The most suitable antiseptics and germicides to use if required.

Now, as to the exact position and number of our roots we should be guided by what is the normal condition, at the same time bearing in mind the abnormalities which may occur.

The irregularities in shape, size, and position are so numerous that I shall only attempt to bring before your notice a few of the commoner varieties. The root of the first upper bicuspid is normally a bifid one, but its division into two fangs may not take place until nearly the end of the root has been reached; the remaining bicuspids may also have two roots.

As regards the molars, the fangs of the first permanent molar are the most regular, those of the third the most irregular: the latter having any number up to six. The buccal roots of upper molars are often so small that the finest nerve bristle cannot obtain entrance, these latter I think can be disregarded. The anterior root of lower molars is often bifid and almost hidden by the anterior wall of the pulp chamber, which latter fact also applies to the anterior buccal root of upper molars, necessitating the anterior wall of the pulp chamber being cut away to a considerable extent before it can be brought well into view, and I will take this opportunity of saying that it goes a long way towards success to be careful to thoroughly open up the pulp chamber, and to do so at such a point that we shall be able to get at our roots with the best advantage; for instance, it is best to open up the pulp chamber of a molar anteriorly, although there may be a cavity already formed posteriorly, provided that the posterior cavity does not extend so far forward as to allow of the roots being brought well into view. One more example may be taken, in the case of incisors with an interstitial cavity, here it is often best to operate upon the root canal from an opening on the lingual aspect.

As to the enlargement of root canal, there is considerable difference of opinion. In my experience it is not necessary in every case, in fact, in some instances, only adds an unnecessary danger to our operation.

Roots warranting such enlargement of their root canals, are those the walls of which are soft superficially, and permeated with decomposing and septic material, the removal of which is a great advantage, not to say a necessity. The first portion of a canal one-fourth or one-fifth of its length may often be enlarged, giving a mechanical advantage in packing.

When a Morey drill is used to enlarge the canal, it is better to measure the length of the latter with a bristle thrust through a small portion of rubber dam to act as a guide, so as to make sure we do not approach too near the apex. I should not recommend the use of sulphuric acid to enlarge the canals, because it is apt to set up irritation, and its destructive action is not under very good control ; but it is certainly very useful in cettain cases, attended by the presence of pulp stones.

The septicity of our roots may be best guaged by—(*a*) Previous history ; (*b*) Odour ; (*c*) Chemical action set up by the introduction of peroxide of hydrogen.

(*a*) History.—We may be pretty sure of our root being aseptic in the case of a living, healthy—although perhaps irritated—pulp, which has been devitalised by arsenious acid, and removed with antiseptic precautions, such as the use of the rubber dam, sterilized instruments, and the introduction of a wisp of cotton wool, saturated with some antiseptic, such as eucalyptus oil, into the emptied canal.

On the other hand, the roots of a tooth, the pulp of which has been killed by an exposure and the entrance of micro-organism will be necessarily in a septic condition.

(*b*) The odour obtained from some roots is, to say the least of it, extremely disagreeable ; but, nevertheless, it is a most valuable guide, which I think is often lost by the introduction of such odorous substances as iodoform, which, although considered by some to be such a valuable antiseptic, has been proved to fail as a germicide.

(*c*) Peroxide of hydrogen pumped up into the root canal, gives, by its decomposition, and consequent evolution of bubbles of gas, when brought in contact with any septic matter, a good test of the condition of a root.

Having taken into account the septicity of our root, the next step is to dress it with some suitable antiseptic or germicide.

Carbolic acid 1 in 10 to 30 is one of the best germicides I think we can employ, it is not diminished in its strength by the presence of alkalies and albumin, as is the case with mercuric chloride. It is best not used in connection with oils or alcohol, as solutions in the latter are not so effective as aqueous solutions. Its antiseptic strength, according to Miquel's tables, is 1 in 333.

I should like to bring before your notice another antiseptic and germicide, namely, mecuric iodide, its germicidal power is 1 in 20,000, antiseptic strength, 1 in 40,000, it does not precipitate albumin, as is the case with perchloride, and is therefore more penetrating. Those operators who use the mercuric chloride will find it advantageous to add five parts of sodium chloride to one of the sublimate, this prevents, to a large extent, the precipitation by albumin.

There are several other points in connection with the preparation of root canals for filling which I should liked to have touched upon, such as difficulties caused by insufficient or superabundant calcification, perforation of the root, etc., but our energetic secretary, Mr. Stanley Colyer, especially intimated to me that a short paper only was required, as time to-night is rather limited, but I venture to hope that the discussion following will be a long and useful one. In conclusion, let me thank you for your very patient hearing.

Reports of Societies.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE Ordinary Monthly Meeting was held on the 1st ultimo, the PRESIDENT (Mr. R. H. Woodhouse) in the chair.

The CHAIRMAN, prior to the reading of the minutes, referred to the recent elevation of Sir Joseph Lister to the Peerage, and, commenting on the immense services which he had rendered to the medical science with respect to antiseptic surgery—benefits which the dental profession participated in so largely—he said it had been suggested the congratulations of the Society should be conveyed to him upon the honour he had received. The proposal was carried by acclamation.

The following gentlemen were proposed for membership :—Russell Barrett, L.R.C.P., M.R.C.S., L.D.S.Eng. ; Charles W. Glassington, M.R.C.S., L.D.S.Edin. ; J. Lewin Payne, L.D.S.Eng.

The following gentlemen were elected members:—W. W. Gabell, L.D.S.Eng. ; A. T. Hilder, L.D.S.Eng. ; J. G. Wallis, L.D S., Glas and Ire. ; A. C. Strand, M.R.C.S., L.D.S.Eng., L.R.C.P., L.D.S.Eng.

The CURATOR (Mr. Storer Bennett) announced that he had received some further specimens of bone work as a result of his appeal at the last Meeting. One was an exceedingly interesting specimen, received from Mr. T. Rubery Chambers, showing how much progress had been made since that sort of very laborious work was undertaken by the profession. He further gave detailed particulars of some eight other specimens of work produced in the workroom of the late Dr. Medwin. Mr. Morton Smale had also presented a highly interesting skull of a child, said to be six years of age. It had the very flattened face commonly found in children the victims of inherited syphilis. The most interesting point about the specimen was that in the lower jaw the root of the right first permanent molar (not erupted but about to erupt) was placed quite transversely, so that its buccal surface looked towards the back of the temporary molar. The small, partly developed crown of the right second permanent molar looked somewhat inwards and backwards, while the partly developed crown of the second molar on the opposite side looked directly backwards. Of course, the second permanent molar was generally directed with its masticating surface forwards, more or less towards the back of the first permanent molar. In the present case the tendency was exactly in the opposite direction.

Mr. H. W. MESSENGER read notes of a case of double hare lip with cleft of the hard and soft palates. The patient, a boy aged 5½, was a posthumous child, born at full time, natural labour. The mother was strong, but about the seventh week of pregnancy she had acute nephritis of malarial origin. The intermaxillary bone carrying the corresponding piece of lip was growing from the tip of the nose. The front of buccal and nasal cavities was open, the ends of the lip corresponding with the sides of the nostrils, and there was a complete cleft of the hard and soft palates. The family history revealed double hare lip in the paternal sister, and single hare lip in a son of the eldest brother. Models and photographs of the case were shown.

Mr. G. H. Bowden gave an account of a case of deafness following bilateral dislocation after extraction of molar teeth. He successfully removed three teeth from the patient, a lady, aged 37, with the straight forceps without fracture. On regaining consciousness the patient was found to have bilateral dislocation of the jaw. An attempt was made to reduce the dislocation, but owing to the removal of the molar teeth on the left side it proved a difficult operation. Nitrous oxide was administered again, when the reduction was easily affected. A four tail bandage was advised, and the patient dismissed. A fortnight later Dr. Ogle (who had administered the gas) asked Mr. Bowden if he had heard anything further of the case, and on his replying in the negative, informed him that the patient was stone deaf in the left ear. Mr. Cumberbach, of St. Bartholomew's Hospital, to whom the patient was sent by Dr. Ogle, wrote that his first impression was the deafness was due to nervous shock (the fright on finding her jaw dislocated) but the pain she had disproved this, as primary affections of the labrynth are not painful. He could only imagine that the violent wrench of her jaw by pulling on the cartilaginous meatus and through that the membrane, set up inflammation of the tympanum, which spread to her labrynth, but against this was the fact that traumatic panotitis was very rare—and to him unknown—in anyone as old as the patient. Mr. Bowden heard through Dr. Ogle that the patient brought about a second dislocation on October 31st. Soon after this she began to have conduction of sound in the left ear through the temporal bone.

Mr. W. A. Maggs said Mr. Bowden wrote him on the subject, and judging from the facts put before him, without seeing the patient, he was led to the conclusion that it was a case of *post hoc non propter hoc*, but against this was the opinion of Mr. Cumberbatch, who had the advantage of seeing the patient, and he thought it might be due to traumatic causes. The fact that some amount of hearing had returned spoke hopefully for the future of the patient; and, personally, he would be glad if Mr. Bowden would bring a record of the case before the Society, say, twelve months hence.

Mr. Montagu F. Hopson said it would be interesting to know how soon after the extraction and the dislocation the deafness had occurred. It was not rare to find deafness associated with caries, or other troubles connected with the mandibular molars. Did Mr. Bowden subsequently examine the sockets from which the teeth had been removed to see where there was any septic inflammation? In Hilton's lectures on "Rest and Pain," a case of deafness, with discharge from the ear, would be found associated with a carious mandibular third molar. The deafness and discharge being both cured by the removal of the tooth. That case was interesting inasmuch as the trouble occurred to no less a person than the late Dr. Addison. The case of a servant girl, who had been troubled with a similar condition of things to that existing in the case of Dr. Addison, was brought to him a year or so ago. She also had several carious molars, both in the maxillar and the mandible, in addition to a purulent discharge from the ear on that side. The removal of the teeth effected a cure of the trouble.

Mr. BOWDEN, in reply, said he should be happy to report the case twelve months hence, provided the patient came under his notice. In answer to Mr. Hopson, he had not had the opportunity of examining the sockets.

Mr. H. BALDWIN then read a paper on "Cement and Amalgam Fillings." In experiments out of the mouth he was struck with the facility with which oxyphosphate cement and amalgam mixed together, and the readiness with which the former laid hold of the latter, from which he conceived the idea of lining a cavity with cement, and while the cement was soft filling the rest of the cavity with amalgam, thus combining the advantages of each material without the disadvantages of an intimate mixture of them. His method was to excavate the cavity with the usual care as regards removing all decay, but undercutting was not necessary to anything like the extent required for either amalgam or gold. He dried the cavity thoroughly, and, having first mixed the amalgam to a convenient consistency, he mixed the cement decidedly thin—not much thicker than would be used for fixing crowns. He then filled the cavity with cement, preferably by means of the same spatula used for mixing it. He immediately pressed a large piece of amalgam into the cement with a smooth rounded instrument, driving it more or less firmly home, working from the centre to the circumference, and so expressing much of the cement on all sides. He quickly cleared the edges of the cavity of both cement and amalgam by means of spoon or other excavators till not a trace of anything was left on any of the edges, especially at the cervical edge, should the cavity be an interstitial one. This obviated the danger of getting the work exposed on the surface when the work was finished. The remaining cavity he filled up with pure amalgam, carrying it down to the cervical edge in small pieces, with possibly a trifle more mercury added so as to ensure it going down completely. He then finished with harder amalgam, and squeezed with bibulous paper in the well-known way. In large composite fillings he used a matrix, which might be applied either before commencing to fill or immediately after packing the first piece of amalgam, and clearing the edges. Putting on the matrix after clearing the edges kept the matrix clean and free from cement. The cases for which this composite filling was suitable were practically all those generally considered suitable for amalgam alone, and a great many considered suitable for cement alone, and, in addition, a great many which would otherwise be suitable only for gold. Ordinary amalgam as a filling material was open to many objections from which the combination was entirely free, and the combination presented a number of merits which belonged to it alone. Mr. Baldwin then, in detail, compared the combination point by point with gold or amalgam. He was of opinion that all those cases of cement fillings in back teeth which one met with as permanencies would be better treated by coating with amalgam as described ; that most teeth filled with cement as a trial for a temporary purposes would be better filled permanently by the method advocated. Where the cement would be tolerated this combination would equally be tolerated, and whereas it was exceedingly difficult often to pack simple cement tightly against the cervical portion of a deep interstitial cavity, it was perfectly easy by means of the amalgam to drive the cement well home. He was also of opinion that the supposed tendency of cement to undergo specially rapid solution at the cervical edge did not exist. The disappearance of cement and appearance of a cavity in this situation was due to the cement never having been in absolute apposition with the tooth at the point, or to the decay there never having been thoroughly removed. The difficulty of packing plain cement at that point was not generally realised, and lay not only in the remoteness of the situation, but in the fact that a little moisture frequently bedewed that part, and that the gum presented a prominent and possibly overhanging edge ; that edge, when pressed upon, was specially liable to give forth a serous oozing. Thirdly, nearly every amalgam filling would be improved by being inserted by this method. Specimens of fillings by this plan were exhibited.

Mr. CORNELIUS ROBBINS said it seemed very evident that the much abused material amalgam was now for the first time receiving true scientific attention. It had many imaginary faults and a few real ones, and Mr. Baldwin had attacked two or three of the latter, more particularly that of shrinkage ; others perhaps might presently be overcome. For the past five or six years he had been endeavouring to work on the same lines. He regretted Mr. Baldwin disapproved of the mixture of oxyphosphate and amalgam, which he had himself found so useful.

Mr. A. E. BAKER said that some eight months ago he put in a large compound filling of Harvard Cement and Flagg's Amalgam, which, owing to violent pulp irritation in the patient, he was compelled to remove, and had remarkable difficulty in doing so. In cutting out an ordinary amalgam plug he generally cut from the centre first and tipped in the two sides and so easily removed it, but in this case he had to cut away every piece of the filling to the cervical edge and to the dentine.

The PRESIDENT said he saw a small saucer-shaped cavity in a bicuspid out of the mouth filled with soft oxyphosphate with an amalgam attached and a spring wire inserted into the amalgam. The filling was allowed to harden for a day or two and then the amalgam was torn asunder from the tooth ; it was found that a strain of 13lbs. was required to accomplish this, and even then the osteo was left in position. The experiment seemed to show the strength this form of filling must give to weak teeth.

Mr. G. CUNNINGHAM said there was no reason why oxychloride should not be used in the same way as oxyphosphate, over which it had one great advantage, namely, its syrupy character, and moreover it was a germicide, while phosphate cement was not. Powdered copper sulphate might be mixed with the phosphate cement. In front teeth one used a variety of ingredients, but he had not yet determined in his own mind which was the best. He had used powdered mercuric chloride and phenol salol. The composite filling was the one which gave as nearly as possible ideal requisites.

Mr. W. RUSHTON desired to say that this method of filling teeth was first brought to his notice by Mr. Humby, seven or eight years ago. He differed with Mr. Baldwin, inasmuch as he mixed the phosphate as thickly as possible, and for two reasons, one to save time, and the other in order to make the pellets into a neat little ball, which might be dropped down into the cavity and so get no phosphate adhering to the margins.

Mr. W. R. HUMBY wished to point out that the phosphate does not of necessity control the amalgam. If they had a contracting amalgam it would not hold it, but would contract itself out of the phosphate. It was necessary, therefore, to select a phosphate which would stand the ink test, otherwise the cement would be left behind and the amalgam would peal away from the surface. Then, again, as to removing every particle of the oxyphosphate from the margins, that he did not think was necessary. If it were microscopic in quantity it would also be microscopic in importance, indeed, a very minute quantity was a benefit rather than a detriment, inasmuch as it prevented staining of the enamel which might overlay the filling. The phosphate should be so to speak incorporated as closely as possible with the tooth substance by rubbing it in and mixing it reasonably thin. He had had a good many years experience and had only found one amalgam which would stand the test of time, and that was Flagg's Submarine. By making a dry rub of good coloured amalgam over the finished surface of the submarine, the disadvantage of blackness would be removed and they would really have a very perfect filling indeed. He always made a practice of keeping the teeth charged with moisture while excavating, and then at the last thing he dried the surface of the tooth, and by this means the diameter of the cavity did not materially alter after the amalgam was inserted.

Mr. W. HERN wished to hear from Mr. Baldwin which osteos and amalgams he preferred. The case of the amalgam leaving the osteo he had not found to any extent. In his own practice he had used Harvard cement, but mixed neither too hard or too soft. He had been in the habit of putting rather a thicker layer of osteo into the cavity than suggested by Mr. Baldwin, and then driven the amalgam into the osteo with an instrument in differrent directions, forming pegs, or retention points, while the osteo was still soft.

Mr. BADCOCK had found this method very useful also in the construction of difficult crowns ; for example, where the root of a lower molar had gone considerably below the gum on one side. He then fitted a band to it and put some soft osteo inside the ring, securing a firm hold and then finishing by filling up with amalgam. In that way one obtained a crown which was very satisfactory. In constructing such difficult crowns the angle at which one cut the root should be considerable, so that the space left between the projecting root inside the band should be sufficiently wide to enable one to force the osteo down to the lowest point and so obtain adhesion.

Mr. LEONARD MATHESON asked if he had heard Mr. Baldwin aright that he had such faith in the method he described as to practically discard the use of gold in crown cavities? If so, he should like to know whether he felt that the phosphate did prevent the flow of the amalgam so absolutely as to make it cling to the margin of the cavity as closely as a properly adapted gold filling. If that were so it would almost make a revolution in practice.

Mr. E. LLOYD WILLIAMS agreed with Mr. Humby as to the danger of amalgam shrinking away from its anchorage. If specimens could have been submitted that had been in the mouth for at least five years he was of opinion it would be found that this contraction had actually taken place. He had tried the method for a good many years, but had given it up on this account. Perhaps his manipulation might not have been as perfect as it should ; but he believed that although one might have a better filling than with amalgam alone, still there was this contraction going on. He was sorry Mr. Baldwin had discarded the method of incorporating amalgam with zinc phosphate so soon, and thought there was still plenty of room for the use of that combination.

Mr. HUMBY said he had been accused of speaking disparagingly of Mr. Baldwin's method, but such was really not the case. He would like to say a word as to the amalgam leaving the cement. There were two ways in which it might occur, one was when they had a comparatively small cavity filled with a comparatively large shrinking amalgam, there was a tendency for it to peal away from its attachment. If they had a large filling, say of submarine, it would be found that a different state of things occurred ; it would be found that the amalgam had undergone enlargement in spite of attachment to the wall of the teeth and the fragment of the tooth which remained burst. He had an instance in his own practice where the remaining walls had simply fallen off from the expansion of the submarine. Submarine expanded when it was in very large bulk. It was advisable when a certain amount of amalgam had been put in to dig little graves—so to speak—in it, filling each of the graves with some cement, so as to cut the otherwise huge bulk of the crown into separate portions.

Mr. H. Baldwin, in reply, objected to the use of oxychloride as suggested by Mr. Cunningham, on account of its extremely caustic nature. Mr. Humby had said that some amalgams shrank and crawled away from the cement, that might be so, but he had not found it to be the case.

The proceedings then terminated with the usual votes of thanks.

LIVERPOOL DISTRICT ODONTOLOGICAL SOCIETY.

The Third Ordinary Meeting for this Session was held in the Medical Institution, on Friday evening, January 15th, at 7.30 o'clock.

Dr. Waite (the President) was in the chair, and there were 20 members and 11 visitors present.

The Hon. Secretary read the minutes of the last meeting, which were confirmed.

Mr. Rose mentioned a case of attempted excision of the crown of a central, under nitrous oxide, which resulted in extraction, as the tooth had an abnormally small root.

Mr. Dickin handed round a new instrument, made by Ash, which fitted on to the engine hand-piece and guided a fissure burr so that a root could be "curved" with greater facility for a band crown.

The Casual Communications were discussed by Messrs. Edwards and Hargraves.

An adjournment took place at 8 o'clock, and tea and coffee were served in the Council Room. After the adjournment, Mr. Dall, of Glasgow, gave his paper on "Porcelain Inlay Work." (See page 99).

The paper was very fully illustrated with lantern slides and specimens in table cases, which Mr. Dall had been good enough to bring with him.

After a very hearty discussion, in which Messrs. Edwards, Royston, Bates, Woods, Rose and Parsons took part, the Lecturer was cordially thanked for his paper and beautiful specimens, and the meeting terminated.

DENTAL STUDENTS' SOCIETY, DENTAL HOSPITAL OF LONDON.

A General Meeting of the above Society was held on Monday, February 15th, at 7.30 o'clock; the President (Mr. C. F. Rilot), in the chair.

The minutes of the last meeting were read and approved.

On Casual Communications being called for—

Mr. H. H. Belsey showed a right upper second molar extracted by him from the jaw of a man, aged 23. The crown is rather oblique, and all the roots are fused together for two-thirds of their length; and there is also an extra root between the anterior buccal and palatine roots. The first molar had a similar irregularity.

Mr. L. F. Barton showed a right upper second molar extracted by him from a lady, aged 26. The crown is very oblique, and the roots are fused nearly as far as the apex, at which point the anterior buccal root becomes free, and turns backwards to lie outside the posterior buccal root, which is displaced inwards. The tooth was easily removed with stump forceps.

Dr. T. Miller showed the right upper first bicuspid of a woman, aged 23. The crown is very poorly developed, and the root shows great absorption. In reply to a question from the President, he said that he thought the root had been absorbed and not mal-developed; there were several other stumps in the neighbourhood exhibiting a similar condition.

Mr. Douglas Gabell showed an upper left canine extracted from a woman, aged 40 years. There was a distal cavity in the crown, and through this the operator had attempted to remove the nerve by means of a Morey drill; the operator had not obtained any direct access, and when, half way down the root, the instrument broke, being unable to remove this broken fragment, the operator put in a carbolic dressing, and sealed it in with an osteo filling. Periostitis supervening, the tooth was extracted. On examination, the root canal was found to be quite normal, with the drill lodged half way down, beyond which the pulp had decomposed.

Mr. Gabell also showed the models of a girl, aged 17. On the right side the second temporary molar was wedged between the first bicuspid and first molar, and almost buried under the gum. On the left side the first molar had been removed a week ago, and the temporary molar was similarly placed, but much decayed, and the second bicuspid was erupting between the pieces. Mr.

Matheson removed the right temporary molar by means of a Read's forceps, when the roots were found to be two-thirds absorbed, but no trace of the second bicuspid could be felt in the space thus created.

Mr. J. Douglas showed the skull of a young mouse, which he had prepared by enclosing it in a box with a few bluebottle flies, by this means the skull was beautifully cleansed and the parts not in the slightest disarranged.

The President said that he had heard of Mr. Gabell's second communication previous to the meeting, and had brought down a model of a child, aged nine years, which seemed to show an early stage of the same abnormality, the second temporary molar on the right side being below the level of the first temporary and permanent molars, and impacted between them.

A short discussion ensued, in which the President, Mr. Gabell, Mr. Green and Mr. Percy Smith took part.

Mr. Stanley Colyer said: I had the fortune the other day to see at a fever hospital a rather exceptional case, which I consider to be of great interest. The patient, a man, aged about 20, had been sent in certified as a case of diphtheria, and had been received, although not presenting the usual conditions seen in diphtheria. The membrane was not symmetrical, but was confined entirely to the left side of the mouth, covering the hinder portion of the left border of the tongue, the gum around the lower molar teeth, and the tonsil. The case being unusual, careful bacteriological examinations were made, but in no instance was the Klebs-Loeffler bacillus found. After the patient had been in hospital one or two days, it was discovered that he had an abscess in connection with one of his lower molars. The offending tooth was removed, and from that time the membrane began to clear up and soon disappeared. The diagnosis was therefore changed from diphtheria to membranous stomatitis.

Dr. Austin, having been appealed to, said he had never seen or heard of a case like it before, but he had seen many cases where a rough tooth had caused a whitish appearance on the mucous membrane of the cheek. He asked Mr. Colyer whether the membrane could be taken off as in ordinary cases of diphtheria?

Mr. Colyer said that he was unfortunately unable to answer Dr. Austin's question. He added that since he had seen this case he had asked several dentists whether any such case had come under their notice, and that many of them had replied in the affirmative.

Mr. Rilot stated that he had never come across a case in the least resembling the one Mr. Colyer had related.

Mr. Percy Smith agreed with Mr. Rilot, and stated, in addition, that during the last few years he had had ample opportunity, as many thousand children had come under his care.

The President then called on Mr. W. Green to read his paper entitled "A Few Points in the Preparation of Roots previous to Filling.' (See page 106).

The President thought it very important to open up the cavity gradually, as well as thoroughly, and in the use of antiseptics it did not matter so much which one was used as the way it was used.

In the discussion which followed, Dr. Austen thought that if Mr. Green referred to the red iodide of mercury, it was very likely to cause trouble should any pass through the apical foramen, as it was a drug with extremely irritating properties.

Mr. Gabell said that the anterior buccal roots in upper molars were by no means so small as many people believed ; he also thought accessory roots were commonest between the palatine and anterior buccal roots in upper molars, and that in lower molars a double posterior fang was more usual than an abnormal root ; he thought it very important to thoroughly cleanse out crown cavities before opening up the root canal.

Messrs. Percy Smith, T. H. Miller, W. B. Woodhouse, and W. May also took part in the discussion.

The President then read his Inaugural Address. (See page 102).

Notice having been given that at the next General Meeting the Revised Rules of the Society would be brought before the Meeting for its approval, the meeting was adjourned at 9.30 p.m.

A Conversazione will be held at the National Dental Hospital, on Thursday, March 11th, when Mrs. Howard Mummery will present the prizes for the Session 1895-96.

THE DENTAL RECORD, LONDON: MAR. 1, 1897.

A UNIQUE CASE.

Heinrich Niemeyer, of Delmenhorst, narrates, in the *Monatsschrift* for February, an interesting case of the eruption of a right upper central on the facial surface of the upper lip, immediately below the nose. The patient was 60 years of age, and a somewhat weak-minded woman. The margins of the opening in the lip were inflamed and covered with inspissated pus. Niemeyer easily removed the tooth with a pair of forceps. The tooth was horizontal in position and implanted in a healthy alveolus to the right of the middle line. The wound healed rapidly and well. The cutting edge of the tooth was unworn, showing the three cusps, but the mesial one was broken, owing to the enamel being undermined by extensive decay. The root was short, thick, and slightly curved at the apex. As far as could be learned from this weak-minded patient, a swelling appeared on the middle of the upper lip about two years previously, which suppurated. This was followed, at an uncertain date, by the eruption of the tooth. The character of the edges of the wound suggested that this was some time ago, and, we may add, the carious condition of the tooth almost proves this. No other teeth, nor remains of teeth, were present in the upper jaws, which were shrunken, showing the teeth to have been some time lost. Niemeyer is of opinion that this is a case of decayed eruption of the natural tooth owing to its faulty position. It was impossible to ascertain whether there had or had not been a gap between the teeth at this point. He has only been able to find record of one other case of eruption of a tooth on the facial surface, namely, a wisdom tooth, given in Baume's *Lehrbuche,* we presume this to be the case of which a wax cast is in our own Odontological Museum. Taking into account the comparative frequence of teeth being delayed in eruption owing to their being malplaced, it is certainly a matter for note, and, indeed, for thankfulness, that they should so rarely erupt on the face. The cause of this malplacement of teeth is extremely obscure. The fact that canines are the teeth whose eruption is most commonly delayed, owing to their long axes approaching the horizontal rather than the vertical position suggests that the cause of this position is in many instances due to their natural place being closed in by the undue approximation of the adjoining teeth, or, perhaps, to the persistence of their deciduous predecessors. The canines being developed at a plane so much higher than the other teeth could naturally twist into almost any position as they moved downwards. But with other teeth no such explanation is available. The central, for instance, is developed behind its predecessor, and we cannot well believe that the persistence of this could have permitted, and, therefore, would not have caused this tooth to have assumed its horizontal position. And the same argument opposes the idea that we can look for the cause in the approximation of the left central and right lateral. It is true in this case there had been a blow on the face some forty years previously, *i.e.*, when the patient was 40 years old, but the tooth shows no signs of violence, and we cannot suppose that a blow would cause an unerupted tooth to revolve around its long axis and not cause such a lesion of the surrounding bone as to have left some permanent trace, objective or mental. Undue density of the gum and bone have also been mentioned as causes, but rather than accept such extremely speculative suppositions, it would be better to admit we do not know. Like many another abnormality it points to a freak of nature, cause unknown.

News and Notes.

MR. JAMES F. RYMER draws our attention to the fact that the British Dental Association had *absolutely nothing* to do with the Brighton Dental prosecution. The registered dentists in Brighton were the prosecutors.

THE National Dental Hospital held a very successful smoking concert on February 13th, at the Frascati Restaurant, with a long and varied programme. Mr. F. G. Read was in the chair.

AT the Blackpool Petty Sessions, on February 2nd, a prosecution was brought by the British Dental Association against Oliver L. Jackson, chemist, 68, Church Street, Blackpool. Mr. R. W. Turner, London, on behalf of the Association, said that the defendant was charged with having on February 4th exhibited placards at his business establishment which implied that he was a thoroughly qualified dental practitioner, and further with having led the public to believe that he was a registered member of the Association. On the day named, William Fisher Thomas Brown, of London, saw in Mr. Jackson's shop window a set of artificial teeth, and therewith was a statement of prices, which also set out that he had one thousand living testimonials, leading the public to believe they would get skilled treatment, as the words, "Consult Mr. Jackson," were also displayed. Mr. Fletcher, for the defence, submitted that nobody had been misled and the placard was perfectly legitimate. The bench, after retirement, found that Mr. Jackson was technically guilty, and fined him in one case 20s. and costs, and in the other 5s. and costs.

AT the fifth Annual General Meeting of the Incorporated Edinburgh Dental Hospital and School, on January 29th, Mr. W. Bowman MacLeod presiding, Mr. Thomas Wallace, the Treasurer, reported that the total ordinary revenue was £778 9s. 7d., and the expenditure £542 11s. 2d., leaving a balance of £235 10s. 5d. The special contributions were £207 1s., making £442 19s. 5d. of surplus funds. At the beginning of the year the debts amounted in all to £3,392 18s., which had been reduced to £2,949 18s. 1d. Mr. Stuart, the Hon. Secretary, gave the following statistics:—Permanent stoppings, 3,943; dressings and temporary treatment, 1,039; dentures supplied and repaired, 200—in all, 5,182. The total extraction cases numbered 10,064, of which 5,046 were under anæsthetics. The total preservation cases amounted to 5,182, against 4,771 last year, which showed that the real purpose of the institution was being more and more appreciated by the poorer classes. The growing popularity of the school seemed to be well maintained, there being forty-eight students on the roll. The following gentlemen were elected as directors:—Mr. John Rutherford, W.S., and Mr. James Gardner; Dr. James Jamieson, F.R.C.S.E., being re-elected. The interim appointment of Mr. D. Robertson Campbell, L.D.S., was confirmed; Mr. F. Page, L.D.S., was promoted to the senior staff on the resignation of Mr. James Macintosh, and Mr. H. H. Chapman, L.D.S., appointed to the assistant staff, vice Mr. Page. Dr. David A. Farquharson was appointed to the chloroformist staff on the resignation of his brother, Dr. J. M. Farquharson.

THE thirty-sixth Annual General Meeting of the Liverpool Dental Hospital was held on January 29th, at the Town Hall, Liverpool. The Lord Mayor presided. The Annual Report stated that the total number of patients admitted since the formation of the hospital amounted to 381,802. During the past year the number of patients treated at the hospital was 23,514, and of operations 35,722, which was an increase as compared with the previous year; the increase in respect of operations relating to conservative dentistry and extractions under anæsthetics being 2,524. The patients' voluntary contributions amounted during the year to £132 3s. 9d. The hospital is still encumbered with an indebtedness to the bank amounting to £622 in respect of the alterations and extensions, and there is also a mortgage on the premises of £450. In addition, a balance of £46 14s. 11d. is due to the Hon. Treasurer on working account. The Lord Mayor moved and Mr. W. H. Quinby seconded the adoption of the Report.

THE Annual General Meeting of the governors and subscribers of the Brighton, Hove, and Preston Dental Hospital, was held at

116, Queen's Road, Brighton, on Jannary 29th. The Committee of Management stated that the number of subscribers had increased, and the deficiency in the accounts had been wiped off, The number of cases treated during the year was 3,492, against 3,053 in 1895, and the expenditure upon anæsthetics, instruments, &c., had increased from £13 14s. 4d. to £27 4s. 4d. The accounts showed a credit balance of 6s. 3d., the receipts having been £201 12s. 3d., including subscriptions amounting to £80. Sir Joseph Ewart moved the adoption of the Report, which was agreed to.

THE Annual Dinner of the Liverpool Dental Hospital took place at the Adelphi Hotel, on February 20th, under the presidency of Sir James Poole, chairman of the committee. During the day the Midland Branch of the British Dental Association held its quarterly meeting in this city. The meeting proved to be one of the most successful gatherings of its kind on record. Amongst those present were Messrs. George E. Campion, R. Edwards, J. R. R. Scott ; W. L. Jackson ; George Wynne, Dr. Gemmell, Dr. Waite, J. Wood, E. J. Phillips, R. M. Capon, F. Rose, Reginald H. Bates, J. P. Roberts and W. H. Gilmour. After the loyal toast, proposed from the chair, had been duly honoured, Mr. Nixon, in an admirable speech, proposed "The Hospital Committee and Staff." Mr. George Wynne responded on behalf of the committee, and Dr. Waite on behalf of the staff. The toast of the Midland Branch of the British Dental Association was proposed by Dr. Gemmell, and responded to by Dr. Gaddes, of Harrogate. The other toasts were "The Guests," proposed by Mr. Capon, and responded to by Mr. Campion, representing the Manchester school. The students had provided an exceedingly interesting musical programme, the accompanist, Dr. Livesey, contributing materially to the success of the entertainment. The chairman's health, proposed by Mr. R. Edwards, was received with the greatest cordiality ; and the reply of Sir James Poole was exceedingly happy. Altogether a most enjoyable evening was spent.

THE following questions were set at the February Examination of the Royal College of Surgeons in Ireland :—

In Dental Surgery and Pathology—(1) For what purposes is cacain used in dentistry? Discuss its therapeutic value. Is it advisable to inject this drug into the tissues? Give reasons for your answers. (2) State some of the causes of discoloration of the front incisors. Describe any fairly successful method of bleaching a front tooth. (3) What is Miller's view of the influence of bacteria in producing dental caries? Do you know of any much older authority who expounded the same view in different terms? (4) Enumerate some of the hard formations to be found in the dental pulp; explain their occurrence. What were Salter's views? (5) Under what names has pyorrhœa alveolaris been described? Write a short note on the course, pathology, and treatment of this affection.

In Dental Mechanics—(1) Explain the method of tempering an excavator. (2) State, accurately, the method of finishing vulcanite work when removed from the flask. (3) Describe how you will obtain the correct bite for the construction of a complete upper and lower denture, and mention the difficulties accompanying same. (4) Write a short account of the properties of gold, and state how its properties would be affected if alloyed with (*a*) silver; (*b*) copper; (*c*) platinum; (*d*) zinc. (5) Describe two methods of removing tin, lead, and silver from gold filings.

From the Section of Dentistry of the Twelfth International Medical Congress in Moscow:—The Organising Committee of the Section of Dentistry of the Twelfth International Medical Congress in Moscow have the honour to add hereby the programme of the occupations of the mentioned Section and to address themselves to all their colleagues, surgeons, and dental surgeons, with the urgent request to contribute to the success of the above-mentioned Section by participating personally in its occupations, and by a report upon one of the questions in the said programme. In accordance with Section 17 of the Regulation of the Congress, papers dealing with the subjects named in the programme will have preference over others. This does not, of course, exclude communications upon other subjects, but such communications can only be read provided that time permits. It is very important to receive the paper or, at at any rate, a short account of it, before May 1st, 1897, for printing and distribution amongst the members of the Congress. The

Manager of the Section is Dr. F. Rein. The Members of the Committee:—Dr. I. Kowarsky, Dr. N. Nesmejanov and Dr. S. Urenius. Address—The Manager: Dr. F. Rein, Moscow, Little Dmitrowka, h. Scheschkow.

A Correspondent in Ireland (co. Cavan) sends to the *British Medical Journal* the following: An extraordinary instance of superstition in this county came to my notice some days since. A funeral was taking place about a mile from this town. Several old skulls were thrown to the surface in digging the grave, and as they lay on the ground a respectable young girl took up one and tried to pull a tooth from it with her own teeth. Failing in this, she tried another skull, and succeeded in forcibly extracting one. She explained to a bystander that it was to cure toothache, and that the pain would now leave her teeth and go to the remaining teeth in the skull. In the event, her toothache got much worse, and no wonder, and her mother, to make things right, travelled off to the graveyard with the tooth, and once more committed it to the earth. I find this strange superstition still exists here even among the better class of the peasants.

Various instances of the use of peculiarities of the teeth as aids in convicting criminals have been published from time to time. The following, sent by a correspondent to the *Rocket*, are interesting:—"Not very long ago," he says, "poachers were in a Yorkshire Assize Court charged with the murder of a keeper. One of the prisoners had the mark of a bite upon his wrist, and an examination of the jaws of the murdered keeper showed that he had a peculiar conformation of the teeth. Plaster casts, both of the wounded wrist and of the murdered man's jaws, were made, and, the two tallying exactly, the man was convicted, but was not hanged."

"Almost the same thing happened recently in the case of a widow, Cremieux, at Neuilly, in France, a man accused of murder having certain marks of bites on his right hand. The poor woman had one tooth in her upper and two in her lower jaw, and a cast made showed that these fitted exactly, and without the shadow of a doubt, into the wounds in the hand of the accused. But even more remarkable still was the evidence provided by dentistry at Manchester Assizes, not long since. A gentlemen, who had a small dog with him, was attacked on a dark night by a ruffian who, after knocking him about, robbed him, and then promptly effected his escape. A tramp was arrested for the crime, but the prosecutor could not swear to him as the culprit, the night having been so dark, but the injured man pointed out that he had bitten his assailant on the hand, and that his little dog had also assisted with his teeth. The man arrested had marks on his hand, and he also bore the marks of a dog-bite on his legs. He accounted for the latter by saying that a farmer's big dog had worried him. A dentist was, however, called in, and he showed the court and jury conclusively that the prosecutor's little dog must have produced the leg wounds."

" THE murderer of a Herr and Frau Schneider was convicted at Vienna by means of a dentist's skill and an apple which had been bitten and left near the scene of the crime. The teeth of a man suspected fitted exactly with the bitten apple."

" BUT perhaps the most singular of all these points of detection by dentists was provided only lately by the bringing to justice of the murderer of a banker in St. Petersburg. Just near the dead body was a much worn cigar-holder containing a half-smoked cigar. From the particular excellence of the cigar itself it was supposed at first that the banker must have been smoking it, and yet this very excellence tallied but strangely with the poor quality of the cigar-holder. Certain employees of the banker to whom suspicion pointed rather vaguely were, by the direction of a shrewd police magistrate, examined as to their teeth and jaws by a dentist, and the guilty man stood detected at once. Half-a-dozen dentists showed in the most conclusive manner how the teeth of the accused fitted precisely into the marks on the well worn cigar-tube."

THE twelfth annual meeting of the Glasgow Dental Hospital was held on February 24th, at 5, St. Vincent Place, the Lord Provost presiding. The report stated that the directors had to deal during the year with the question of providing new premises for the Hospital. As they did not feel, in the meantime, justified in going into a building scheme, the choice of suitable premises was limited, and a lease had been taken of premises at 5, St. Vincent Place, where there was increased accommodation. The removal had caused some dislocation of work. The average number of patients each year had been 6,037, while last year the number was 4,034. This, however, represented 5,897 operations in varions forms of dental disease, of which 2,072 had been preservative operations. The income from students' fees during the year was £135 9s. £282 11s. had been spent on alterations and equipment, but there was still a balance on hand of £70. The directors regretted a falling off in public subscriptions, which had amounted to £82 7s. The Lord Provost moved the adoption of the reports. His lordship referred to the good work which was done in the hospital. The report was satisfactory. Mr. J. D. Hedderwick seconded. The report was adopted, and, on the motion of ex-Collector Miller, the office bearers were re-appointed. The auditors were re-appointed on the motion of Mr. Fleming, and a vote of thanks to the Lord Provost closed the proceedings.

Legal.

DENTISTRY PROSECUTION IN EDINBURGH.

In the Edinburgh Sheriff Summary Court, on February 17th, Sheriff Orphoot had before him a complaint, at the instance of William Broomfield Paterson, 64, Brook Street, London, F.R.C.S., L.D.S., hon. sec. of the British Dental Association, with concurrence of the Procurator-Fiscal, against Alexander Emslie, residing or carrying on business at 1, Rankeillor Street, Edinburgh, to the effect that he had contravened the third section of the Dentist Act, 1878, in so far as, not being a person registered under the said Act, and not being a legally qualified medical practitioner, he had taken or used a name, title, addition, or description, implying that he was a person specially qualified to practise dentistry by one or other or all of the following methods:—(1) By displaying, since October last, a signboard at his premises with the words "American dentistry" thereon; (2) by having a brass plate affixed to his door with the words "Dental Office" thereon; (3) by using, on 6th November, a business card with the words "American dentistry.—Persons desirous of having dental work done will do well to call at our office, and save at least fifty per cent." thereon; and (4) by exhibiting on the same date a diploma purporting to be granted by the Dental Society of New York, authorised by the said Legislature, and to confer on Alexander Emslie the degree of Master in Dental Surgery.—Mr. T. B. Morison, advocate, appeared for the respondent, and objected to the relevancy of the complaint, as the complainer had not set out his title. The Dental Statute of 1878 had set forth a definite person to prosecute, and that person was not the complainer. The Summary Jurisdiction Act and the Dental Act of 1878 were the only two under which the complaint was brought, and unless these statutes justified a prosecution at the instance of private persons, the case must absolutely fail for want of title. With regard to the third and fourth charges, counsel contended there was no locus specified; and the words "American densistry" and "dental office" implied no personal qualification. If he had put up the words "Teeth drawn here," that would not imply that he was specially qualified to draw teeth. It was only an intimation that he was willing to draw teeth. It would be a qualification which would attach to his premises. The words did not come within the reading of the section, and the section in the circumstances must be construed as strictly as the words could make it.—Mr. Dewar, advocate, replying for the prosecution, contended with reference to the point that there was no title to sue, that the Medical Act of 1886 had repealed the section upon which counsel for the respondent had founded his argument. As to the third and fourth charges libelled it was not possible to place a locus on a business card; and it was enough if the respondent caused the diploma to be exhibited. Counsel argued that the words "American dentist" and "dental office" were used with the object of inducing the public to patronise the premises as a place where American dentistry was practised, in view of the fact that American dentistry had gained a high reputation in this country.—The Sheriff said he would consider the relevancy, and give his decision on Tuesday. On Tuesday, February 23rd, the Sheriff repelled the objection to the competency of the action raised on the ground that the prosecutor was a private person. The objection to the relevancy of the third and fourth charges, to the effect that no locus had been stated, the Sheriff sustained, but he found that the prosecutor was entitled to go to trial on the first and second charges. It was clear to him that both descriptions implied that the person who put them there meant to practise what was described. The case was continued for trial till 4th prox.—*The Scotsman.*

Abstracts and Selections.

TREATMENT OF STOMATITIS.

1. *Stomatitis Aphthosa.*—The ulcers must be frequently touched with a cotton swab dipped in one of the following solutions :

℞	Sod. salicyl	20·0
	Aqua distill	100·0

or,

℞	Sod. borici	3·0
	Sod. salicyl	5·0
	Tinct. myrrhæ.	4·0
	Aqua distill	30·0

or,

R	Sol. chloric	6·0
	Aqua laurocer	15·0
	Syr. althea	25·0
	Decoct. papav	200·0

The patient must drink only boiled or sterilized milk.

2. *Stomatitis Erythematosa.*—If the inflammation of the mucous membrane of the mouth is associated with teething, the mouth must be frequently cleansed, particularly after meals. Use for this purpose the usual boric acid solution, or the following :

℞	Sod. boric	2·0
	Sod. bicarb	4·0
	Aqua distill	100·0
M.	Ft. sol.	

3. *Stomatitis Ulcero-membranosa.*—In this form potassium chlorate gives the best result, and it should be used internally as

well as locally. For a child, five to ten years old, a dose or 2 grm. a day for internal use is sufficient.

℞	Potas. chlorici	5.0
	Mel. rosat	20·0
	Decoct. salep	80·0

M. Sig.—A teaspoonful every two hours.

Paint the ulcers with following :

℞	Potassium chlorici	4·0
	Mel. rosat	10·0
	Glycerin	20·0

M. Ft. sol.

In any stubborn cases dilute tincture of iodine should be used :

℞	Tinc. iodi	10·0
	Glycerin	20·0

or,

℞	Potas. permang	0·05
	Aqua distill	75·0

M. Ft. sol.

4. *Stomatitis Gangrenosa.*—This is the most severe type of the diseases of the mucous membrane of the mouth, and calls for energetic treatment. Above all it is necessary to thoroughly cauterize the gangrenous portions. For this purpose chlorcalcium is to be preferred, but it must however remain in contact with the ulceration only for a few minutes, and be followed at once by irrigation to remove every particle of the chlorcalcium which may have remained behind. The cauterization must be repeated twice daily. In the meantime the patient should frequently use a strong decotion of cinchona as a gargle. In less intense cases cauterization with the following may be sufficient :

℞	Naphthol	10·0
	Sod. sulforicinat	90·0

and the following gargle may be freely used.

℞	Sod. bicarb.	
	Sacchari	āā 1·0
	Acid. salicyl	4·0
	Spts.. vini	200·0

M. Sig.—One tablespoonful to a glass of water for gargle.—*Die Therapie der Gegenwarth, 1896, xxxvii., 690.*—Translated in *Pediatrics.*

EUCAINE.

L. S. SOMERS (*Therap. Gaz.*, January 15th) has recently used eucaine in a series of cases of hypertrophic nasal catarrh in place of cocaine to produce anæthesia of the englarged turbinals, so that reduction in their size by cauterisation might be effected. A four per cent. solution of eucaine nydrochlorate in distilled water was used, this corresponding to the strength of cocaine solution previously employed for that purpose. The drug was applied to the turbinated bodies in the same manner as cocaine, by saturating a cotton plug with a definite quantity of the solution, and applying it to the part to be operated on until anæsthesia was complete. The cauterisation was effected by means of chromic acid crystals melted on the end of an appropriate applicator by means of the alcohol lamp. The results obtained can better be expressed by comparing the effects of cocaine and eucaine *seriatim*. Cocaine usually produces its anæsthetic effects in the nasal cavity in from three to five minutes, anæsthesia continuing for twenty minutes to half an hour. In the series of cases in which eucaine was used anæsthesia was not complete until eight or ten minutes had expired, and the loss of sensibility remained about twenty minutes. When an excessive amount of cocaine solution is used in the nares it occasionally flows backwards into the nasopharynx, producing a very uncomfortable sensation of numbness in that region. It was noticed that this did not occur so markedly when eucaine was used, probably because of its slower anæsthetic action. Eucaine causes hyperæmia of the mucous membrane when locally applied. This action is directly opposed to that of cocaine, and renders the drug of little value when the turbinal tissues are much hypertrophied, as the cauterising agent cannot be introduced into the nasal cavity without injuring the septum. This action of eucaine in producing a temporary local congestion militates greatly against the use of the drug in active inflammatory conditions, but may possibly be obviated by using equal parts of the eucaine and cocaine, as recommended by Berger. Eucaine is a poison similar to cocaine, but has the great advantage of being decidedly less harmful to the organism when used in the same doses. Another advantage which the drug possesses over cocaine is that it may be kept for an indefinite time in solution with sterilised water, 1 part to 10. The solution may be repeatedly sterilised by boiling, without imparing its anæsthetic properties. Pouchet, at a meeting of the Société de

Thérapeutique *(Sem. Méd.*, February 3rd), said that he had investigated the physiological action of eucaine, and had found that the toxic equivalent of that drug was almost equal to that of cocaine. Moreover, eucaine may produce toxic effects which may even prove fatal without any prodromic stage. It acts on the heart with an intensity equal, if not superior to, that of cocaine. In a frog in which 2 mg. of eucaine were injected there was observed a considerable slowing of the heart's beat with arhythmia, whereas equal doses of cocaine produced no effect. Eucaine must therefore be looked upon as rather a dangerous anæsthetic. Reclus, who has studied the effects of eucaine from the clinical point of view, has satisfied himself that in equal doses its anæsthetic power is less than that of cocaine, and he thinks therefore that it should not be used in serious operations. J. S. Gibb (Philadelphia *Polyclinic*, January 23rd) has used eucaine in diseases of the throat and nose, and sums up the results of his experience as follows: (1) Eucaine is equally efficient with cocaine as an anæsthetic in ordinary examinations. (2) Eucaine possesses equal anæsthetic power with cocaine, and hence is as useful in operations in the nose, pharynx, or larynx (3) Eucaine is nearly, if not quite, as effective as cocaine in reducing engorged turbinates. (4) Eucaine is superior to cocaine in that it is less likely to produce toxic symptoms. (5) Eucaine is superior to cocaine in that it produces far less unpleasant subjective symytoms; especially is this true as regards the pharynx.—*British Medical.*

EUCAINE AS A LOCAL ANÆSTHETIC.

Eucaine, which is, according to Professor Charteris, a "methyl ester of a benzoylated oxypiperidine, carbo-oxylic acid," possesses some undeniable advantages over cocaine. It is capable of synthetic manufacture and so is cheaper; and it does not possess the mydriatic effect of cocaine. Whether, however, it deserves all the encomium lavished upon it in respect to its greater safety appears open to doubt. Professor Pouchet, in a paper read before the Société de Thérapeutique, on Jan. 27th, asserts that eucaine is a powerful cardiac depressant, and in some instances produces sudden death without warning. Injection of 2 milligrammes into a frog caused slowing and irregular action of the heart, while a like dose of cocaine produced no effect. He regards eucaine as inferior clinically and as far more dangerous than cocaine. Upon the other hand, Professor Charteris and Dr. MacLennan recently communicated to the Royal Society of Edinburgh a paper dealing with the physiological action of eucaine, which gives that body a favourable aspect. Solutions were injected hypodermically into guinea-pigs. A lethal dose of eucaine was found to be 0·09 gramme (per kilogramme of body weight), that of cocaine being 0·068. The phenomena of dying eucaine showed less head rotation, less opisthotonos, less salivation, and less difficulty of breathing ; the symptoms, moreover, took longer to develop than was the case with cocaine, while larger quantities than of the latter were required to produce toxic effects. The influence upon the heart is not mentioned. It must be confessed that we do not at present possess sufficient knowledge of the physiological and clinical behaviour of eucaine to pronounce a definite opinion upon it.—*Lancet.*

CATAPHORIC MEDICATION.

By Fielden Briggs, D.D.S., L.D.S., D.Sc.

Cataphoresis may be described as the electrical diffusion of fluids and substances through the soft and hard tissues. It is an electrical osmosis. Though slight electrolysis may co-exist, yet cataphoresis has no connection with it, and its effects are independent.

If the tissue or skin be made a positive pole and some distant part the negative, a medicamental fluid placed at the positive electrode will have a tendency to flow with the current, and be driven through the body towards the negative pole. To prove this let the electrodes be placed upon a piece of meat at a distance apart from each other ; if the positive pole be tipped with copper, a deep stain of oxychloride of copper will be found in a few minutes at the positive pole, in the act of being forced through the meat to the negative electrode. Professor Morton tatoced his own arm by driving particles of lamp black incorporated with salicylate of soda into it, using the positive electrode.

These facts open up a wide field for the investigation of its applicability and usefulness. After washing the back of my hand (1) I placed the positive electrode upon it, and holding the negative in my hand, I then applied a current of three milliampères 20 volts for twelve minutes. No anæsthesia resulted ; (2) I placed a 20 per cent solution of cocaine hydrochlorate on cotton on the back of the hand at the same place as before and allowed it to remain for twelve minutes without result; (3) Placing the positive electrode over the cocaine and holding the negative inside the other hand, I applied the current, and in a few minutes the part was so benumbed that I was able to thrust in a needle a quarter of an inch deep. Anæsthesia cataphorically produced had occurred in the last instance.

A word about the apparatus required is necessary. A continuous current up to about 40 volts must be obtained by using either thirty-two Leclanche cells, accumulators, a dry battery, or street current. If the street current is an alternating one, it must be transformed into a continuous one. Motors may be procured for this purpose. A rheostat capable of dealing with minute currents is also required, and here, let me say, that most of the ordinary rheostats are useful for dental purposes, though they may be used for the skin and mucous membrane. In medical or surgical practice, applications of from 1 to 500 milliampères are needed; but in dental operations only $\frac{1}{20}$ of one milliampère to three or four milliampères are used, and for this reason an instrument is necessary capable of efficiently controlling such small currents. The nerve of a tooth being of an extraordinary sensitive nature, the current must be minute, and its increase be in fractions of a volt to prevent giving pain. The Wheeler volt selector does all this, and seems to be the best rheostat for the purpose. A milliampère metre is necessary to record the quantity administered. This varies with the resistance of the tissues. In medical practice any current below five milliampères is useless in the majority of cases, but the dentine of a tooth is so sensitive to electricity that a fraction of a milliampère is easily felt passing through, and five milliampères are so high as to be rarely used. A variety of detachable electrodes will complete the outfit. More electrodes can be made as required to suit the case in hand.

Morton uses for cataphoric *medication* soluble positive electrodes of oxidisable metals. He screws on bulbs of either copper, zinc, silver, iron and so forth, according to the case to be treated, *e.g.*, passing a bulb of copper into the throat in pharyngitis. He mentions a case of extensive lupus which almost entirely disappeared by using cataphoric medication with soluble metallic electrodes. As a local anæsthetic for the skin or mucous membrane a watery solution of cocaine hydrochlorate, four to eight per cent., is effective. An eight per cent. solution of cocaine in guaiacol shortens the time.

The skin should be previously washed to get out the oil, and a porous layer of thin felt or blotting paper saturated with the solution intercepted between it and the positive electrode, which latter consists of a flat piece of platinum as large as the surface to be anæsthetised. The negative sponge electrode can be held in the hand or placed anywhere on the body. Cataphorically driven into the tissues no toxic effects have been observed, such as often follow hypodermic injection of cocaine.

In dental practice I have found cataphoresis extremely successful. In a case of periodontitis the pain was entirely dissipated by the application of a 50 per cent. watery solution of iodine to the gum over the root of the tooth. A chronic alveolar swelling over the root of a tooth disappeared after three applications of potassium iodidein solution, allowing an interval of two days between each.

Sensitive dentine can be so obtunded that a tooth may be drilled without the slightest pain for such purposes as filling, and I have repeatedly taken out the exposed and living nerve without giving any pain.

The *modus operandi*, which will apply to all cases, briefly, is as follows: The patient holds the sponge negative electrode, moistened with a 1 per cent. solution of sodium chloride in the left hand. After applying the rubber-dam to the tooth, a ball of cotton is placed in the cavity saturated with a 30 per cent. solution of eucaine hydrochlorate or a 15 or 20 per cent. solution of cocaine hydrochlorate in guaiacol, or in water. The positive platinum needle is placed upon the cotton. Into the circuit are introduced the volt selector and the milliampère meter. The current is now gradually turned on, beginning with an imperceptible amount and increasing very slowly, until the patient feels a slight burning sensation. When this occurs, *increase* must be at once stopped, until, the anæsthetic having penetrated, all sensation of uneasiness passes away. The current can then be gradually increased until the tooth is absolutely numb. More solution must be added to the cotton from time to time, either by turning off the current and removing the cotton, or by moistening the cotton *in situ* with a drop tube. I prefer the patient to himself turn on the current at the volt selector with the right hand; this insures the current not being increased so as to produce pain. The amount necessary varies with individuals, from a ½ to 2 milliampères being all that is required to anæsthetise a tooth sufficiently to cut it to pieces, or to extract a live pulp.

The chief objection is the time consumed, from seven minutes to sometimes as long as fifty minutes being required ; though some of the time is saved by being able to operate at greater speed because painlessly. Further investigation and experiment may probably reduce this time.

In extraction of teeth a double cup, tong-shaped electrode, positive on each side of the tooth, is used. But cataphoric anæsthesia does not appear to be invariably successful for extraction, in many cases only partial effect being produced, and in some none at all. This may be accounted for by the difficulty of adapting the electrode to fit all round the tooth. At the same time anæsthesia can be obtained sufficiently to trephine painlessly a new socket through a toothless gum for the purpose of implanting another tooth, and it is preferred by the patient to a hypodermic injection. A discoloured tooth may be beautifully bleached by cataphorically using 20 per cent. solution of peroxide of hydrogen, care being taken to seal up the root canal with gutta-percha to prevent its being driven through the apex. There seems to be a future of usefulness in minor surgery for cataphoresis, and in dental surgery it is already proving a great boon.—*Medical Annual.*

A CONSERVATIVE ESTIMATE OF THE VALUE OF CATAPHORESIS IN DENTISTRY.

By C. W. Jones, D.D., St. Paul, Minn.

From accounts published in the January and February numbers of the *Dental Cosmos*, I was led to believe that sensitive teeth could be completely anæsthetised by cocaine cataphoresis, and at once resolved to give the process a trial, and will therefore give the result of my observation and experience of this process in various cases. Being somewhat sceptical as to the practical advantage of this process, for the reason that it did not appeal to me from reports given that the process was a success in cases of extreme sensibility in nervous patients, and not wishing to spend $50 or $100 for an apparatus with which I had no personal clinical experience, I secured for trial a 50-cell battery, with Wilm's current controller. Here is the result :—

Case 1.—Patient, a lady aged about 45, of nervous temperament, and exceedingly sensitive teeth, but bears pain with fortitude. In attempting to excavate a labial cavity in a left inferior incisor my patient could not allow the operation to proceed ; I then applied guia-cocaine cataphoresis for 15 minutes. With the exception of a few twinges of pain from the electric current, due to a faulty manipulation of the instrument, the balance of the operation was completed without the slightest pain.

Case 2.—Patient, young lady, aged 15. Teeth soft and not hypersensitive. With Wilm's current controller, 30 to 40 volts was reached in two applications of 15 to 20 minutes each, anæsthesia was profound enough to drill deep retaining grooves without pain. Time consumed in preparing these two approximal cavities in superior bicuspids was one and half hours. The anæsthesia in these two cases was evidently much more complete than was possible by other methods known to me, so I at once ordered a Wheeler Fractional Volt Selector, and the following cases I report from the use of that instrument. It may be noted here that the last mentioned patient was perfectly willing to bear the pain of excavating, and did not call for an anæsthetic, as I had at previous sittings excavated and filled six or eight cavities, the most sensitive of which were in the wisdom teeth, posterior and labial cavities, too inaccessible to manipulate cataphoresis. I therefore consider cataphoresis of little value in such cases, because I could not use it where it was most needed, and other methods would bring about the same result in less time.

Case 3.—Young lady, aged 15, two sup. approx. cavities in right bicuspids, not sensitive to breaking down enamel walls, but very sensitive on reaching dentine. Cataphoresis in both cavities at once. Seven volts reached in 10 minutes ; 40 volts reached in 18 minutes. After 20 minutes time both cavities were nearly prepared, but a second application of 40 volts, reached in five minutes. Balance of excavating was painless. The following day I prepared and filled two approx. cavities on left side of the mouth for the same patient who remembered that the pain was greater on the previous day from the electric current.

I had, however, not observed any distressing symptoms excepting when the current approached the six and seven volt mark. Cataphoresis then would seem to be of little value in her case.

Case 4. Patient, young man, aged 28. Two sup. right bicuspid approx. cavities. Teeth hypersentive. In attempting to excavate, patient would flinch, snap his fingers, and protest against my going on with the operation. Guia-cocaine cataphoresis was then applied simultaneously in both cavities; 40 volts was reached in 11 minutes without pain. Current continued four minutes. Result—posterior cavity thoroughly anæsthetised, interior slightly sensitive to the last cutting. Patient remarked that it was the least pain he had ever experienced in having teeth filled.

Case 5.—Little girl, aged 13. Simple crown cavity in inferior molar. Patient both apprehensive of, and sensitive to pain. I had previously filled several cavities for this patient, but it required a great deal of patience and coaxing on my part, which made the operation very irksome to me. In attempting cataphoresis, I could not reach above one and two-thirds volts in 12 minutes time. Cavity was still sensitive. A little leathery dentine was removed, and in a second application two volts only could be reached in 12 minutes. Cavity still sensitive. Patient remarked that she would rather be hurt with the burr than to have "that thing" on her tooth. Here is where the current should be increased continually instead of by fractions of a volt, which is impossible with a Wheeler instrument.

Case 6.—Young lady, aged 16, of an excitable temperament; hypersensitive teeth. Small posterior cavity, superior right molar; one and half hours time was consumed in applying guia-cocaine cataphoresis. Could not prepare cavity for gold, and was obliged to fill with cement. Result, a complete failure.

Case 7.—Patient, middle-aged lady, of nervous temperament and hypersensitive teeth. Small posterior cavity left superior molar. A current of about 23 volts was reached in 20 minutes, with but little inconvenience to the patient. I was just about to replenish the cotton pledget in the cavity with more guia-cocaine, when my patient became frightened, and even grew hysterical, pleading for me not to administer any more, as she was just about losing consciousness. The current was discontinued, and these symptoms disappeared in a moment. In excavating the cavity, the dentine was found to be only slightly anæsthetized. This is the only instance in my knowledge, or that has been brought to my notice through reports, where there has been any toxic effects or systemic conditions of this nature that have been brought about by cataphoresis for sensitiue dentine.

Upon inquiry my patient informed me that on previous occasions in having her teeth excavated, she had been in the habit of taking chloroform or nitrous oxide, or "something," to the point of almost losing consciousness, and that she behaved in the same manner on those occasions.

The only possible explanation I can give for this effect is that it was of a psychic nature, and was brought about entirely through the medium of the imagination, I might go and enumerate a number of other cases, some of which were successful and some unsuccessful in the same mouth, but time will not permit, as those I have cited are fair examples of cases that present themselves to us in general practice.

It will be observed from the foregoing that cocaine cataphoresis for sensitive dentine, though producing true and profound anæsthesia in certain favorable cases, is quite limited in its application.

Unless we have an anæsthetic that can be applied in cavities like those of posterior and labial cavities in wisdom teeth, and others where it is unpracticable to use the rubber dam in the first place—cavities often the most sensitive in the mouth ; unless we have one more effective than this method seems to be in obstinate cases of patients sensitive to the electric current ; unless we can have one that the pain so often complained of in the first stages of this process in irritable teeth can be dispensed with, and without the consummation of so much time, we have yet to continue our researches and experimentation.

While I admit that this process promises a more universal usefulness than anything we have before had at our command, it is not of much assistance in a large percentage of cases where an anæsthetic is mostly needed. Dentists in the east seem to have had better success than the report I have given, but we all know that the climate of Minnesota is conducive to nervousness, consequently our patients are more sensitive to the electric current, which in a degree would lessen the usefulness of this method.

I will say that for the extirpation of pulps when nearly or slightly exposed, this method is a complete success, and the apparatus necessary is worth having for these cases alone.

As yet I am unable to make a statement as to its value where the pulp is congested, but would suggest that a new exposure below the congested part be made, and introduce the current at that point.—*Dental Review.*

MANUFACTURING AMALGAM.

By H. L. Cruttenden, D.D.S.

I will now give you a few hints on a subject that is more in the line of dentistry. In casting amalgam the forms of ingots I use are made of two pieces of cast iron, the faces are dressed, and with guide pins are clamped together, one large and one small hole are drilled or turned out. In the small one is placed a steel mandrel, turned down to fit with another part that is not round projecting into the larger opening, This mandrel is the proper size to fit into the No. 5 chuck that comes with the Redman lathe, it having a set screw added, as explained further on. With this mandrel placed in the proper place, and the part clamped together with a common quilting frame clamp, your ingot is ready for the molten metal.

In the "American System of Dentistry," Vol. III., page 813, is given Dr. Keller's analysis of the principal dental amalgams ; select the formula you wish, proceed as described in that work, using a crucible furnace. If you have not gas in your office, you can use a gasoline apparatus, which will do just as well. When the metals are fused and poured, the ingot is taken apart. This you can put in the chuck of the lathe, and set by the screw as described heretofore, file with a coarse file, or turn into shavings if you prefer. I have paid for years $6.00 per ounce for an amalgam, which is rich with gold, the same amalgam I can make for $1.40 per ounce, or in other words, I can melt a crucible full, which holds about 7½ ounces, cast and file up in one day an amount that costs for the metals, $10.50 for which I would have to pay $45.00 to the trade, a saving of $34.50—not bad for one day's work, and a rainy day at that.—*Dental Review.*

Reviews.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION FOR 1896. S.S. White Dental Manufacturing Co., Philadelphia.

An interesting volume, though most of the papers, therein contained, have been previously published in the *Cosmos*.

ARTIFICIAL CROWN AND BRIDGE WORK. By GEORGE EVANS. Fifth Edition. Revised. Philadelphia: The S.S. White Dental Manufacturing Co.

That this book, which is universally admitted to be *the* text-book on this subject, should have reached its fifth edition is a matter on which we offer our sincere congratulations to the author; indeed, it should run through many more editions, for each dentist should possess himself of a copy. In this edition the author claims that "every effort has been made to bring it abreast of the advances made. In order that the presentation may be comprehensive without being bulky, obsolete matters have been omitted, descriptions of unimportant varieties have been curtailed, repetitions avoided as far as possible, and an endeavour made to treat the various phases of crown and bridge work concisely, but never sacrificing clearness for brevity." A comparison with an earlier edition substantiates this statement. But we think, considering the interest recently aroused by the introduction of small gum furnaces and in the making of whole porcelain crowns by their means, a chapter on the various ways in which these are made might well have been added.

COMPEND OF DENTAL PATHOLOGY AND THERAPEUTICS. By HENRY H. BURGHARD, M.D., D.D.S. Special Lecturer upon Dental Pathology and Therapeutics, Philadelphia Dental College. Published by S.S. White Dental Manufacturing Company, Philadelphia.

This book consists of a series of questions with answers, grouped so that a given subject is elucidated by the series. As it is expressly stated that the book is not intended "as an aid to students in memorizing answers for an examination," we fail to see the advantage of writing the book in this form. We readily admit that it permits the author to condense a mass of facts into the small compass of 138 pages, of which a large space is, of course, taken by the questions, but in our opinion this has been accomplished at the risk of such brevity that, taken alone, this book would give an incomplete and even a wrong idea on some subjects. A few examples will illustrate this. Thus, on page 23, paragraph 19, "Describe the process of suppuration? The pyogenic cocci growing in a tissue produce irritating waste products; and the results of irritation follow, viz., increase and multiplication of fixed cells, followed by the phenomena of inflammation. The organisms excrete a ferment which peptonizes and liquefies the exudation and intercellular substance; the cells die and form pus corpuscles; these cells are themselves liquefied. The inflammatory symptoms are usually more pronounced than in simple inflammations." We doubt whether anyone not acquainted with the matter would learn much from this, apart from the dogmatic statements on still uncertain points. Does cell prolification precede the inflammatory phenomena? Is it settled that all pus cells are dead connective tissue cells? and how can "the exudation," itself liquid, be "liquefied"? All these misconceptions we take to be due to the author trying to give a short dogmatic answer to a question which does not admit it. So, again, in the section on Embolus and Thrombus, the answers do not convey any idea as to the essential difference between these. We might multiply instances to further strengthen our objections did space permit; but though many of the answers command our admiration for the pithy way in which they are given, others confirm our opinion that the style adopted is scarcely suited to this subject. The pages are interleaved with blank paper for the purpose of allowing students to fill in notes at lecture; in a measure, therefore, they will themselves overcome some of the deficiencies of the book, especially, no doubt, members of the author's class, for whom, we imagine, the book is specially intended. The publishers issue the book in their usual excellent way, both as to paper, print and binding.

THE DENTAL RECORD.

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Original Communications.

DENTAL ELECTRO-THERAPEUTICS.

WITH CONSECUTIVE CASES IN CATAPHORESIS.

By FIELDEN BRIGGS, D.D.S., L.D.S., D.Sc., F.C.S., Clifton.

ABOUT a decade ago I wrote as follows :—" Electricity is useful in many ways as a therapeutical agent. A tooth may be bleached by electrolysis by moistening the cavity with an acidulated solution of Na Cl in water placing the negative sponge electrode on the cheek and the positive over the surface to be bleached. In the same manner pyorrhœa alveolaris may be treated by passing the positive electrode into the pockets and liberating nascent oxygen, the negative electrode being terminated by a moistened sponge held in contact with the cheek."

During the years that have followed much thought has been given to the action of the current upon divers drugs introduced in or about the teeth, and so by a process of evolution the present knowledge has been arrived at. We now recognize that with a weak current a chemical element or compound placed in the cavity of a tooth may be driven to considerable depth without electrolysing it, and the name cataphoresis has been given to this phenomena. We can drive water, without decomposing it into its constituent elements of O and H, through moistened clay from the positive to the negative pole, and the same may be done with such drugs as cocaine, eucaine, guaiacol, and many others. What the phenomenon is, or why it takes place, no one has satisfactorily elucidated ; but that it may exist either independently of, or concurrently with, electrolysis has been fully demonstrated.

The chief drawback to the application of electricity has hitherto been the inability to control the current sufficiently to prevent the shock of pain sometimes caused by too great a fluctuation in the amount of electricity applied to so delicate a nervous structure as a tooth.

But with recent improved apparatus we are now enabled to so manage a current that it shall vary in pressure by only fractions of a volt, and be so small in quantity as $\frac{1}{10000}$ of an ampère or less ; $\frac{1}{500}$ ampère is sufficient to be effectual in a vast number of cases. As an inducement to those who have not done so to try this method I have given the records of a score of cases, consecutive and not selected, mostly in obtunding sensitive dentine. The apparatus used was the same in all cases, except where specially mentioned. It consisted of a Leclanché battery of 28 cells giving an E. M. F. of 39 volts, which was placed in a cupboard in the workroom. Wires were run from this battery to the surgeries, where they were connected with a current controller. After passing through the resistence of the controller the current was led by two wires to the patient. The polarity of each terminal was tested. The negative one was terminated by a moistened sponge electrode, which the patient held in the left hand ; the positive by a needle or other suitable electrode of platinum. In the case of sensitive dentine this latter was placed upon a ball of cotton inside the cavity of the tooth, the cotton was saturated with a 25 per cent. solution of hydrochlorate of cocaine in pure guaiacol. Where this was not employed the solution used is specially mentioned in each case. I find a combination of eucaine and cocaine very effective, and I am at present making a series of separate investigations with this combination, and these I may publish later on, together with the description of a new Volt Selector or Current Controller I am working upon. After the application the current must be "turned off" gradually before removing either electrode.

In the first case I used a fine rheostat, but I have now abandoned it because the application gave pain, owing to the gradual increase of current not being minute enough. The tooth was an upper posterior second bicuspid, pulp almost exposed : sensitive ingrowing gum. Applied rubber dam, insulated by varnishing with sandarach an amalgam filling which was in the anterior surface of first molar. A 20 per cent. solution of cocaine in guaiacol placed in cavity on cotton, and current applied enabled me to cut away gum and drill most of pulp out without any pain ; deeper than that was still sensitive, so a shred of arsenic dressing was applied and the tooth filled at a subsequent sitting. Pressure, 13 volts : amount of current, 1½ milliampères : time occupied, 55 minutes.

Case II.—Dead lower right front molar, fistula discharging through gum. 15 per cent. solution of cocaine in guaiacol each side of gum: extracted: very slight pain as tooth left socket. Pressed into place alveolus, which had spread on both sides, without pain. Buccal surface of gum suffered from escharotic action of guaiacol.

Case III.—Upper left wisdom: remnant of living pulp in root, could not touch with instrument. 20 per cent. solution of cocaine and guaiacol applied for seven minutes. Drilled a quarter of an inch into canal and removed "nerve" without the slightest pain. Volts 24; milliampères 4. As no rubber dam was applied, leakage of current probably accounts for the comparatively high ampèreage.

Case IV.—Lower right first bicuspid. Aching pulp nearly exposed: 25 per cent. cocaine and guaiacol. First approaches of current gave pain: occupied one hour to reach 1½ volts: ten minutes more increased to five volts. Aching ceased. Increased rapidity to 31 volts without pain. Removed electrodes: excavated a few times: exposed the pulp: some pain: had to apply arsenic dressing. This patient during the process imagined she would be put to sleep and said she "felt very drowsy" until I enlightened her that action was only local, whereupon she was bright and wide awake during the remainder of the operation: imagination may probably account for pain after being cataphorised. Tooth insulated with rubber dam: only $\frac{1}{1000}$ ampère of current passed. It is worthy of note that subsequently three separate applications of arsenious acid with intervals of three days between each failed to destroy the pulp, so I capped and filled over it. This is three months ago, and it has been comfortable ever since.

Case V.—Upper first molar, left. Large anterior approximal cavity, too sensitive to excavate—applied a solution of guaiacol and cocaine for forty-five minutes: 27 volts, 4 milliampères. Shaped cavity and inserted large gold filling without any pain.

Case VI.—Cataphoresis 47 minutes with double rubber cap electrode on each side of lower molar. Extracted tooth "almost without pain." Soreness of gum followed and continued for a week; an application of a 1% solution of chinosol I have since found, will, to a great extent, prevent this, if used before cataphorising.

Case VII.—Buccal cavity, superior first molar without rubber dam, extremely sensitive. Cataphoresis rendered drilling out and filling possible, though cavity could not be touched before. Twenty minutes: 15 volts, 3 milliampères.

Case VIII.—Lower left bicuspid, posterior cavity, extremely sensitive. Applied for five minutes, 17 volts, $\frac{1}{2}$ milliampère. Excavated and filled with gold without the slightest pain.

Case IX.—Upper lateral mesial cavity—patient could not bear instrument to touch dentine. Applied 14 volts, $\frac{9}{10}$ milliampère for 19 minutes, shaped cavity and filled with gold without the least pain.

Case X.—This patient had buccal cavities in the molars at the margin of the gum so sensitive that they could not even be wiped out with cotton wool. Had previously exhausted all obtundents in endeavouring to reduce sensitiveness. Each tooth was treated at a separate sitting.

(1) Cataphoresis 25 minutes upper left molar without rubber dam reduced sensitiveness sufficiently to shape cavity and insert an amalgam filling under the gum.

(2) Applied rubber dam lower right molar and shaped cavity without pain. Fifteen minutes, 9 volts, third of milliampère.

(3) Lower left molar without rubber dam—excavated painlessly after applying 17 volts for 40 minutes, four milliampères.

(4) Upper right molar benumbed after 29 minutes, 22 volts, $3\frac{1}{3}$ milliampères. No rubber dam applied.

Case XI.—Patient had had lower right molar extracted a year or two previously, and suspected from inconvenience it gave him that a root remained embedded in jaw. Examination revealed small opening in gum from which pus exuded; attempt to probe gave great pain and there seemed a probability of the existence of slight necrosis. With tweezers I pressed carefully and deeply through the opening a little ball of cotton saturated with 50 per cent. solution of hydrochlorate of cocaine. I then applied a current of nine volts for 12 minutes, and afterwards was enabled to probe down one-third of an inch, whereupon I found the remnant of a root, which I removed absoultely without inconvenience. Patient delighted.

Case XII.—Upper left badly discoloured bicuspid. Cut out decay; sterilized and filled canal, then applied peroxide of sodium to the cavity and current of 40 volts for ten minutes. Tooth beautifully whitened.

Case XIII.—Upper right second bicuspid posterior cavity. Had been aching violently a week; found pulp nearly exposed, applied arsenic and dismissed patient. She returned in two hours in unendurable agony. I removed the dressing, applied rubber dam. Cocaine and eucaine 25 per cent. solution, took five minutes to reach 23 volts, and 20 minutes longer to indicate 32 volts. The full 40 volts were reached in six minutes more—two milliampères. I then opened out pulp chamber, drilled into each root canal, extracted both the living "nerves" with a barbed nerve broach. Filled canals with g. p. points in chloroform; the crown with gold, and sent her away smiling, the whole having been performed absolutely without a trace of pain or even discomfort. The tooth I subsequently learned has given no trouble since.

Case XIV.—Applied rubber dam and commenced to excavate an upper right posterior canine cavity. Extreme pain prevented my proceeding. As there was not proper retaining form I applied G. and C. and the patient turned on the current to 40 volts, taking only five minutes to accomplish this. I thereupon found the cavity sufficiently anæsthetized to drill proper retaining form and fill with gold without any pain.

Case XV.—Periostitis over upper left bicuspid root. Applied 25 per cent. solution of iodine and cocaine. Thirteen volts and one milliampère of current, time six minutes, relieved pain.

Case XVI.—Upper left central labial cavity. Had previously been filled with gold by another dentist, but through the tooth at that time being extremely sensitive sufficient retaining form had not been possible. Upon my attempting to shape the cavity properly I found it too paintful to proceed. Application without rubber dam for six minutes, using seven volts and three milliampères of current. Drilled good retaining form with bur without a trace of pain. An adjacent tooth, with a cavity so trifling that I did not deem it necessary to apply cataphoresis, gave considerable pain by contrast. This patient was so sensitive to current that it had to be increased very gradually.

Case XVII.—Patient suffered for months with neuralgia. I diagnosed pulp stone in upper right bicuspid as the cause. Three separate applications at the same sitting—of 20, 26 and 17 minutes—necessary. I then drilled through the stone and came upon the living pulp on the other side in the canal; this I cleared out with a nerve broach. The whole was done without pain. The first application of the current gave momentary pain in this case until the anæsthetic had penetrated the stone to the pulp, when it ceased. The full voltage was used, but only 1½ milliampères passed through.

Case XVIII.—Same lady called a few days after on account of another tooth (first bicuspid) from which she got pain. As there were two roots each had to be drilled into in order to get out the lime formation which was present. The application of current took 42 minutes, and one root gave slight pain, which further application of seven minutes obliterated; 1½ milliampères: used 30 volts.

Case XIX.—Case presented itself to me where the upper right central had been snapped off by a dentist with excising forceps and the "nerve" removed from the root with a view to pivoting. I found this remaining root extremely sensitive and it could not even be touched without severe pain. The lady required the other central, which was badly decayed, but with a living pulp, to be cut off and crowned, but said she would not have it "broken off with the pincers." I made a special pitchfork shaped platinum electrode and after placing a solution of C. and G. cum-iodine on cotton up the root, almost to the apex of the right central, I inserted a ball of cotton with guaiacocaine solution in the cavity of decay of the left central. The double positive points were applied, one to each tooth. In 20 minutes, with 17 volts and half a milliampère absolute numbness was secured in both teeth, enabling the left central to be cut off and its "nerve" removed. I then enlarged the canal of the right central, and smoothed the faces of both roots level with the gum with wheels, and finished the case. It is several weeks ago and they have both remained quite comfortable, the tenderness of the right central root never returning.

Case XX.—This patient complained of neuralgia for which no cause could be attributed by her dentist. Search with the electric mouth mirror and probe discovered a posterior cavity in upper left bicuspid decayed almost to exposure of pulp. The patient, who had journeyed a long distance by rail, wished to return the same day. I could not therefore apply arsenic, so decided to cataphorise and extirpate the pulp. To anæsthetise required 50 minutes, but at the end of that time I was enabled to drill out the whole of the living "nerve," without a particle of discomfort to the patient, and to fill the canal and tooth with gold. The neuralgia disappeared instantly, and I received a letter three months after to say there had been no recurrence of any trouble.

Case XXI.—Lower left lateral labial groove deeply indented by chemical abrasion. Too sensitive to shape the cavity. An application of saturated solution of hydrochlorate of eucaine in nine minutes, enabled me to drill proper retaining form, and insert a filling without discomfort to the patient. The quantity of current passing was 1½ milliampères with a voltage of 13.

Satisfactory results depend to a great extent upon the proper management of the current. To those who intend trying this method I would venture a word, and that is that some observance of the laws of electricity is necessary to enable the operator to apply its principle intelligently. He must not expect success if he works by "rule of thumb." But if he thinks out carefully the cause of each part of the phenomena as it occurs, he cannot fail to be extremely gratified with the results. For instance, his battery will need to be frequently tested to see that it is all right, and it may be noted that cocaine solutions should not be more than a few days made, even when in combination with guaiacol, for, notwithstanding the statement of Morton to the contrary, I have found that, even combined with guaiacol, cocaine decomposes, and eventually becomes inert for anæsthetic purposes. An effective plan is to dip a moistened pellet of cotton into fresh cocaine mur: or eucaine in the anhydrous state.

My method of allowing the patient to himself "turn on" and so regulate the current effectually prevents nervous apprehensions on his part.

The principle of the construction of the current controller may be explained as follows:—

The battery of cells is connected directly to the opposite ends of a high resistance, and consequently if a connection be made between one end of the resistance and somewhere along its length, a potential difference would be obtained corresponding to the position of the collector and varying from nil to maximum. The potential will be obtained in varying pressures equal to the initial E. M. F. of the battery, say 40 divided by the number of turns of wire on the resistance, which contains 72 turns per inch of length. It should be understood that the index does not in all cases represent volts, but only 40ths of whatever the battery is capable of at the time of using.

In making applications without the rubber dam, it becomes necessary to thoroughly insulate the electrodes in order to prevent dissipation and loss of current through the moist tissues. The operator can make a variety of electrodes in platinum to suit his own convenience. To insulate them, first make a solution of shellac in alcohol having the consistency of glycerine. Spread this over the electrode, leaving about one quarter inch of the point uncovered, now drive off the alcohol over a bunsen without burning. The shellac will fuse and leave a hard glossy coating. A little practice will produce a smooth, even insulation.

Reports of Societies.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE Ordinary Monthly Meeting was held on the 1st ultimo, Mr. JOHN FAIRBANK (Vice-President) in the chair.

The Minutes of the previous meeting were read and confirmed.

Mr. Robert Stephen Fairbank signed the obligation book, and was admitted a member of the Society.

The following gentlemen were balloted for and duly elected members of the Society :—Kenneth W. Goadby, L.D.S.Eng. ; Henry Wood, L.D.S.I. ; J. B. Parfitt, L.R.C.P.Lond., M.R.C.S., L.D.S.Eng.

The LIBRARIAN reported the receipt of Guy's Hospital Reports for 1896, and the "Transactions of the American Dental Association."

Mr. C. ROBBINS, in describing and exhibiting an apparatus he had devised for a patient, said it was so rare an occurrence to be able to extract anything humourous from their occupation that he felt justified in relating the following circumstance :—A gentleman, holding a responsible position in the Indian Government, suffered from the habit of talking in his sleep, and was fearful lest he should betray State secrets, the partitions of his sleeping apartments being very thin. He therefore wished to know if the habit could be cured or prevented. Mr. Robbins took a model of the mouth, and finding that, fortunately, on each side of the upper jaw a bicuspid was missing, he made an ordinary little vulcanite plate with two teeth and a couple of gold collars so that the plate should remain firmly fixed and not get loose in the night. He then arranged a small metal flap, having a long and short lever, his idea being that the short lever bent upon same would readily displace the long lever when the tongue began to wag. It was arranged with a brooch joint in the vulcanite plate. He found, however, that it did too much, but by making a slight alteration, making a rubber-dam weight, reproducing it in vulcanite, and adding it to the plate in an oblique manner, it answered very well, and gave complete satisfaction to the patient.

Mr. J. H. Badcock then read a paper on " Copper Amalgam : Its Merits and Demerits."

Mr. Badcock said his apology for bringing before them such a well-worn subject was the extraordinary diversity of belief which had always existed, and still existed, on this matter, and the great desirability for some authoritative statement of the real facts of the case. By copper amalgam he meant amalgam made of pure copper and pure mercury, however prepared. There was a great difference in the proportions of mercury and copper in every sample, and even in different pellets of the same sample. Clinical experience seemed to show that the greater the amount of mercury in it the softer the filling would be and the faster it would waste. Dr. St. George Elliott, in a paper read before the Society in December, 1888, said :— " If the ordinary directions are followed, and the spoon removed from the heat on the appearance of the globules, it will be found that the bricks are comparatively weak. It is better to drive off the excess of mercury by overheating and subtracting, subsequently adding what may be necessary to obtain the proper plasticity, than it is to allow some of the combined mercury to remain in the mass." Experimenting lately, Dr. Black had found that fillings " made of the soft mass, as kneaded in the hand, crushed at a less stress than those made of the same material after it was wrung dry; the average crushing stress of those made soft was 170 lbs., varying about 25 lbs. for the different blocks ; while fillings made from the same mass, worked as dry as possible, bore a stress of from 200 to 255 lbs." What regulated the rate of setting—it varied from a few minutes to a few hours—and why was it accelerated by washing the amalgam ? After it had set it might be re-softened by a repetition of the foregoing process. Was this a wise thing to do ? Dr. St. George Elliott and Dr. Black were at issue on this point. The former found no injury resulting, while the latter found "each series of fillings markedly weaker than the first. From a portion of the mass all of the mercury possible was wrung out and more added after it had partially set. This seemed in some way to have a very deleterious effect upon the material. The third series of fillings from this portion of the mass crushed at from 30 lbs. to 40 lbs., while the fourth series could be crushed with the foil pliers." This deterioration was sufficient to deter Dr. Black from making use of any residue of copper amalgam for the future. On the point of shrinkage, Dr. Elliott and Dr. Black seemed again to be at issue. The former found that the best copper amalgam shrunk four times as much as the silver alloys used, while the latter discovered no contraction whatever, even in those made very soft. The quality which gave copper amalgam its value was the fact that it never changed in shape. The edges showed no tendency to curl. In the words of Dr. Black "the material is readily adapted to the walls of the cavity, and this adaptation is not broken up by the contraction of the mass in setting as is the case with other amalgams." Put in a copper amalgam filling how one would, soft or hard, wet or dry, carelessly or carefully, it would stay just as put in for any number of years, its edges as close as the day it was done, as good as those of the best foil fillings—so close, indeed, that but for experimental evidence to the contrary one would say that they were in absolute contact. With respect to its therapeutic action, the opinion of Dr. Miller, of Berlin (based upon his own experiments), that it had power of arresting decay by means of its antiseptic action, was at variance with Mr. Goadby's experiments. In face of this conflict of opinion, Mr. Badcock contented himself with saying that even if copper amalgam did possess some measure of antiseptic action, it was a factor of no practical utility and without clinical significance. This view, supported by Dr. Ottolengui, who said that "practice had not substantiated the claim"; Dr. W. H. Truman "that its antiseptic properties had not the slightest value"; Dr. Ames that "the fillings saved teeth rather by forming a perfect stopping than by antiseptic effect," while Mr. Humby spoke of "an erroneous belief that the salts of copper soaking into the teeth prevented any further decay," and Dr. Black's testimony was, "that the power of the material to arrest caries was in its physical not in its chemical properties." With reference to its supposed hardening qualities, Mr. Badcock had not, to his knowledge, met with a case where the dentine showed any sign of having been hardened by the filling, though he had met with many hundreds where it was soft and disintegrated in spite of being stained a deep black for some distance. As to discolouration, this would be admitted by all, and, inasmuch as the copper salt formed on the surface of the filling was being continually washed off, and some of it found lodgment on the containing teeth of its neighbours in both jaws, it was not uncommon to find several teeth blackened to a greater or less degree, until, after a few years, the mouth presented somewhat the appearance of a coal mine. But the most deadly vice of the material was its wasting, which was also the result of its chemical action. Various theories had been put forward to account for it, and, being no chemist, he had asked Mr. Goadby to make some experiments in order to ascertain what really did take place. The rapidity of the wasting would obviously depend on three factors—(*a*) the density of the filling, *i.e.*, the amount of copper it contained; (*b*) the strength of the solvent, and (*c*) the friction to which the stopping was exposed. The greater the friction the more quickly the film of sulphide would be removed and a fresh surface presented to the action of the solvent. Two of the factors, viz., density and friction, were early recognised, and are, indeed, obvious a few months after the insertion of a filling. The third and most important seemed to have been overlooked. They had been taught that cupped amalgam discoloured badly, and was, therefore, only suitable for teeth at the back of the mouth; that it "cupped" or wore down on surfaces exposed to attrition, and that those were its only faults. As they required it mainly for the back of the mouth, they cared little about its discolouration, and although its "cupping" on masticating surfaces was inconvenient, it was a comparatively trifling fault, easily remedied, and they congratulated themselves on having found a nearly perfect filling material. What was not taken into account was the action of solvents, and the positions in which this action would be likely to be greatest. Experience showed most solvent action to occur in positions where decomposing *débris* collected. The result was as follows:—In a fairly clean mouth all copper fillings in crown cavities, and others above the gum margin not in contact with an adjoining tooth or an artificial plate, if inserted in properly excavated cavities, never failed at the edges, and generally arrested decay so long as there was any stopping left. Mr. Badcock continued: " Now these belong to just that class of cavities which may be filled satisfactorily with almost any alloy we like to take, with little discolouration and no wasting. If, however, the filling extend below the gum margin, the case is different. The gum overlapping the surface of the amalgam protects it from being washed by the saliva, while it holds decomposing particles in contact with it. Whether the secretion from the gum has any solvent action I am not prepared to say. I will take, for instance, the case of an approximal filling carefully contoured and left touching the adjoining tooth at one spot. By reason of the solvent action the whole surface is gradually lost. At first the loss occurs chiefly on the morsal aspect owing to friction in mastication, but in time the approximal surface is sufficiently effected to allow fibres of meat or other food stuff to be forced up between the teeth in eating. This condition will be accelerated if the patient be a careful one, who regularly uses floss silk. Now all the evils appertaining to a badly contoured filling result. As the edges of enamel protect the material immediately in contact with them, the contour from being convex becomes concave, and if there be two approximal fillings, the case is so much the worse. Clearance of food becomes impossible, the gum is pressed upon, inflamed, and caused to recede, exposing the neck of the tooth. Moreover, all this time the collection of *débris* stationary against the cervical edge of the filling decomposes, and causes increasingly rapid disintegration of the amalgam with which it is in contact. If a probe be passed between the teeth, it will be found that the stopping is soft at this point, and gives a peculiar and characteristic sound when scraped, and that the scrapings consist of black sulphide of copper and mercury. As the solution of the filling proceeds, a hollow depression is formed which serves to entrap more *débris*, and so the vicious circle is completed. It is this persistent sticking of food between the teeth that most frequently leads to the discovery of the mischief. Not only is the stopping disintegrated, but the food, collecting on the exposed cervical edge, starts decay in the most difficult and dangerous position for it to occur, viz., above the original cervical margin and entirely under the gum. Frequently these cavities are not discovered until the exposure of the pulp has supervened. This is no fancy picture, but what must occur sooner or later to every approximal filling made of copper amalgam. I speak from bitter experience—indeed, a great part of my time is now occupied in cutting out copper fillings inserted with every care a few years ago, and in repairing the resulting ravages. Many an amalgam that looks perfect will be found to reveal a large cervical cavity on more careful use of the probe. In a Casual Communication made by Mr. Humby to this Society in 1894, he says: 'I can affirm this, that during a practice extending over many years, in no single case were symptoms of failure absent in fillings which came under notice the third year after insertion.' During the first years that I was in practice I used copper amalgam in large quantities, and when after a year or two I began to see results, so excellent did they seem that I rarely used any other amalgam. Then a few failures appeared, and these I attributed to accidental causes or my own defective manipulation, and tried to improve my methods, with no better success. At last I began to doubt the material, but I think it was Mr. Humby's Casual Communication that awakened me to the full extent of the disaster. Still loth to give up my favourite stopping, I tried various means to combat this fatal wasting. One of them was to bring the copper amalgam to a workable consistence by means of the addition of alloy instead of expressing any of the mercury. I found, as others had done before me, that although this improved matters it did not cure them. If one added only a little alloy it did not prevent wasting, though it retarded it, while, if one added more, change of form began to appear. The most successful way seemed to be to face the copper with an alloy. It is very easy to do this, with excellent result, in crown cavities. In interstitial cavities this facing becomes very difficult, and it is not altogether satisfactory. In a few of my cases the facing has flaked off some time after the filling has been completed, thus rather shaking my faith in it." To free himself from the suspicion of bias, Mr. Badcock then gave extracts from the periodical literature reflecting American and English opinion for the past 10 years. Dr. Russell, Brooklyn, Dr. Wood (Mankato), Dr. Custer and Dr. Osman speaking in unqualified praise, and on the other hand, Dr. Darby, Dr. Coon, Dr. Bonwill and Dr. Black being as decisive in denunciation. Mr. Badcock, in reading what had been written upon this subject since 1885, was struck by the fact that concerning no single point in the preparation or manipulation or qualities of this material is there the least unanimity of opinion. Each writer has some faults to complain of and some virtues to extol, and each suggests his own remedy with equal futility. To-day they were little nearer a universal opinion or practice. In respect of English opinion he had less to offer them, as their literature on the subject was scanty. In view of this, he had written to two of the greatest advocates of copper amalgam in this country—men whose reputation for good work is world-wide—and whose opinions were entitled to the utmost respect, insomuch as they had given more attention to this subject than perhaps any one else—he referred to Mr. Claude Rogers and Mr. Boyd Wallis. The former still had a very high opinion of copper amalgam, and when inserted dry, with as little mercury as possible, considered it the best filling for the majority of back teeth were gold was inexpedient. A large amount of the failures at the cervical margin he thought was due to imperfectly prepared edges, or else to moisture creeping in during the process of insertion. If the colour could be overcome and the tendency in some mouths to dissolve away on the surface, they would have the best all-round filling of any. He found it work exceedingly well with osteo mixed in varying proportions according to the requirements of the case. The latter said there could be little doubt as to the value of copper amalgam as a preservative of the teeth, but copper, like all other filling material, would fail sometimes. To avoid failure, great care should be exercised in the preparation of the copper precipitate, and the removal of all oxide and other extraneous matter was highly important. Some years ago he mentioned his method of making copper amalgam to the Odontological Society, but of late had no time to make it himself. The only teeth remaining in one case which came under his notice, that of a gentleman 85 years of age, were filled with copper amalgam, and these had been filled over 65 years previously by a travelling charlatan, who professed to cure all diseases between the teeth and the toes. The conclusions to be drawn from the consideration of the evidence Mr. Badcock thought were :—(1) That copper amalgam should never be used in any tooth were staining would be objectionable. (2) That to prevent wasting and discolouration of adjoining teeth it is always advisable to face it with an alloy, and that in the case of instertitial fillings this is absolutely imperative. Its antiseptic qualities are so slight as not to be of any practical value. A greater effect would be produced by a strong antiseptic applied to the cavity. He believed that this practically limited its use to deciduous teeth, for the saving of which it was eminently adapted, and to exceptional cases, especially those where it was impossible to exclude moisture. Small crown cavities could be easily and well filled with an alloy alone, while large ones with weak walls, and all interstitial cavities, could be better filled by the combination of alloy and cement, as described by Mr. Baldwin at their last meeting. Yet nowhere to his knowledge was there to be found an authoritative statement to that effect. At their hospitals, to the best of his belief, Sullivan was largely used. Their students entered practice with the same time-honoured belief in the virtues of Sullivan, and bought their experience as dearly as many practitioners and many hundreds of their patients had bought it. Here and there some individual raised his voice against it, but he was looked upon as not of the faith, an unbeliever, a monomaniac, or as not having the skill and knowledge to use it properly. It was little less than a scandal that after more than half a century's experience of copper amalgam, the subject should remain the debatable question that it was to-day. In the interests of the public and of their profession some canon of teaching should be laid down. He suggested that if in the opinion of members the subject was of sufficient gravity, a committee should be appointed to investigate and report on copper amalgam. Such a report would carry an authority and produce an effect such as could not possibly be achieved by an individual. While he did not undervalue for one instant the very excellent work done by the Society, he thought that perhaps it might do still more. The occasional appointment, for instance, of committees to investigate subjects of interest and report thereon would be of the utmost benefit to the profession at large. He had in conclusion to acknowledge his great indebtedness to Mr. Goadby for the valuable experimental work that he had done in connection with the paper, and his best thanks were also due to Mr. Humby for the loan of his specimens and the gift of material, and to Mr. Rogers and Mr. Boyd Wallis for their kind replies to his enquiries.

Mr. KENNETH W. GOADBY followed with a paper on "The Discolouration of Copper Amalgam." The points he had endeavoured to solve were the chemical nature of the black and green discolouration, with the effect the latter conditions might have upon micro-organisms. Unfortunately, the time at his disposal had been rather limited, so that the results were rather fragmentary and incomplete. The literature of copper amalgam was most extensive and not a little contradictory, whilst no direct experiments seemed to have been made with the well-known green-staining, although several observers had hazarded a guess. Other observers had made experiments as to its antiseptic properties, notably Miller, who placed pellets of copper amalgam upon plate-cultures, and found that the growth of colonies in their vicinity was inhibited, but at the same time unannealed soft gold had a similar effect. Even allowing that copper does produce an antiseptic effect, it must be by the change of the metallic copper to some copper salt, but a like process could not be ascribed to the gold cylinders. In these circumstances it was thought desirable to confirm Miller's results. Plates of agar and gelatine were poured and small pellets of amalgam dropped on. In all the gelatine plates (five in number) a development of bacteria took place right up to the filling material, which after a few days commenced to turn green. In three gelatine slant tubes a like effect was produced, the amalgam having no antiseptic action whatever. With the agar plates the series of events was even more interesting. Plates prepared in the above way after two or three days showed a distinct growth, the colonies sometimes stretching up to the mass of amalgam, and at other times some little distance away, making a well-marked zone ; so far, Miller was right, but the amalgam in all cases turned green and showed a ring of growth in its immediate vicinity ; control tubes inoculated from this green zone developed rapidly upon agar, broth or gelatine, whilst on agar and gelatine plates not inoculated in the amalgam, thus he was able to point to conclusive evidence that the antiseptic effect of copper amalgam was an insignificant quantity. The explanation of the zone formed round the amalgam in which few or no colonies are to be seen was not difficult to explain when the conditions were considered, the medium agar being a damp one, and when a mass of material is placed upon its surface, the force of capillarity comes into play, a meniscus is formed and the bacteria washed into it by currents set up. Upon gelatine, which is a frier medium, this does not take place. The explanation appeared to him to be perfectly in accordance with the facts, especially as colonies did eventually develop in the zone if inoculated when the agar had dried, whilst at times colonies might be seen below the surface also. Clearly, then, it could not be said that the amalgam exercised any antiseptic effect upon plate cultures; but was its action upon fluid media of an antiseptic nature? The following experiments were made to determine this point:—A series of tubes of broth, saliva and gelatine were inoculated with cultures. (1) from the mouth direct; (2) with streptococci (brevis); (3) impure cultures from the mouth. In all cases a development of bacteria took place. Thus one to three pellets per 10 cc. did not prevent the growth in any case, the gelatine tubes developing similarly in the broth and saliva under the same conditions; the controls grew perhaps a little more rapidly, but the difference was so small that he could not attribute even very slight antiseptic effect to the amalgam under discussion. Miller's experiments with copper sulphate were conclusive as far as they went, but, as would be subsequently seen, experiment rendered the presence of a sulphate improbable, consequently the antiseptic reactions of copper sulphate do not form an altogether satisfactory argument in dealing with amalgams containing copper. With regard to the black stain, several tubes of saliva were taken and small pellets of amalgam dropped in; a solution of sulphuretted hydrogen was next added, the tubes placed in a chamber at the body temperature. Within a short space of time the familiar sooty appearance was to be seen, whilst in those tubes in which the solution was weakest a chocolate brown colour occurred, exactly resembling a condition often noticed in the mouth. Upon gently rubbing the black deposit a shiny surface was exposed, due no doubt to the mercury set free. On again placing the mass in the solution, the surface became once more coated with the black sooty layer, placing beyond a doubt the question of sulphide. In the control tubes the material remained quite bright, whilst in several cases tubes inoculated with an extremely foetid culture of mouth bacilli, the amalgam turned black, the culture having the extremely unpleasant smell of a dirty mouth. In tubes inoculated with pure cultures of the mouth streptococcus the result was not forthcoming. Decomposition of food was a fruitful source of sulphuretted hydrogen, so that the series of events in the buccal cavity was evident, and although the percentage of sulphuretted hydrogen present at any given time would necessarily be small, the process would not thereby be suspended, but only prolonged, the movements of the tongue and the rub of opposing teeth during mastication accelerating the process by exposing fresh surfaces to the denuding action. He had made careful examination of the sooty deposit obtained in this way, and although copper sulphide was always present no action characteristic of mercury was to be obtained; it was not improbable that the mercury recombines with the more electro-negative metal copper, eventually producing the curious pasty condition sometimes met with. This hypothesis he could not confirm by experiment, however, as in all cases a shiny condition was the only result. But the process just described was not the only method by which an amalgam might be disintegrated; the mouth organisms themselves produced chemical changes in the amalgam by which it was softened, eroded and destroyed. The second species of stain, often quite a dark green, was also investigated, and a series of experiments were made, from which Mr. Goadby concluded that there was no reason to suppose that copper sulphate was the active principle in bringing about the staining. On the other hand the acetate reactions were well marked. He next proceeded to produce the green colouration by artificial means. Saliva tubes were taken and copper amalgam added, the tubes then being inoculated with cultures taken from the mouth, and a trace of lactose or dextrin added. In almost all cases, after 48 hours, a greenish tint made its appearance, and gradually deepened until at the end of three weeks the colouration was most marked, the solution being acid. He had not at present sufficient material to determine the exact nature of the acetate formed, but from many considerations it seemed to him extremely probable that it was of an amidic nature, especially as glycocollate was a well-known salt, crystallising in blue needles and obtained by dissolving copper in a solution of glycocoll or amido-acetic acid, and once or twice he had seen needle-shaped crystals from the blue mass formed at the bottom of his cultures. He did not however wish to advance this as more than collateral evidence to a suggestion, as it was probable that other compounds were also formed, for example, peptonate or albumate of copper, but he wished to state, most emphatically, that *à priori* remarks of the formation of copper sulphate were misleading and unscientific, and further, that its supposed antiseptic action depended, and must depend, upon the disintegration of a portion of the filling, a condition at once unsatisfactory and undesirable.

The CHAIRMAN said, so far as his experience went, he had nothing to say in favour of copper amlgam. He did not know whether there were any Dental Surgeons in England who devoted themselves to amalgam fillings to the exclusion of gold fillings, but in America there were several who did so, and in those of their fillings he had examined he had never seen a single flaw. The approximal cavities and the cavities in the masticating surface of the teeth had all been perfect. It struck him at the time that if extraordinary care were taken in the preparation and insertion of the amalgam, gold filling, except in the front of the mouth, might be done away with.

Mr. F. J. BENNETT said his experience was that although by no means a successful filling material, the old Sullivan's amalgam wasted less and was more satisfactory than Roger's, for though the latter did not stain so much, yet it dissolved away more at the cervical edge, and it also cupped more. Though Mr. Badcock had closely restricted his paper to copper amalgams, some of the vices attributed to the amalgam belonged to the metal copper acted upon by the acids of the mouth. That raised the question as to whether in investigating matters relating to copper amalgam, or any amalgam, they were not restricting the subject a little too much ; whether, in fact, they knew enough about the pure metals themselves apart from the amalgams. Recently Professor Roberts-Austen had been carrying experiments more to the foundation of things, enquiring not only whether it was known what an alloy was, but whether it was known what a metal was. In the event of a committee being formed for the purpose of investigating this subject, he would like them not to restrict themselves to amalgams but to go into the whole question of the pure metals.

Mr. W. A. HUNT (Yeovil) said he almost differed with the last speaker. The paper was distinctly on the merits and demerits of copper amalgam, and he thought the subject large enough to engage the profession for some time to come. He thought the papers had most admirably summed up the question. The very fact of copper amalgam having been before the profession for more than fifty years, having been pooh-poohed by some and regarded as a perfect sheet anchor by others, men who were able and capable of judging, perplexed him as it had perplexed many, and he thought the paper should be more carefully gone into. With regard to the properties of metals, and whether a solid was a solid, these were very interesting metaphysical questions, but they did not affect the point under discussion. In London they were able to put their hands upon absolutely pure metals. In amalgam there were but two, namely, copper and mercury, therefore let them narrow the investigation to these two metals, and see if they could not find out some of the reasons and causes for their eccentricities—the marvellous failures on the one hand and the equally remarkable successes on the other.

Mr. CLAYTON WOODHOUSE said he was always brought up to believe that copper amalgam should not be used in interstitial cavities, and when he came on to the staff of the hospital he was horrified to find the way in which Sullivan was used by students. He, himself, confined its use almost entirely to temporary teeth and crown cavities in wisdom teeth.

Mr. MARTIN HENRY found great inequality in the various samples of amalgam, and thought it better, instead of working out the mercury, to mix some submarine fillings to take up the excess instead of facing the Sullivan with an amalgam.

Mr. HUMBY regarded clinical observation as the most valuable and the most available source of information for the dentist ; and, from the number of failures one saw in practice, but one opinion could be formed of the value of copper amalgam. With regard to some of the so-called successes, it was not always easy to make certain of the character of an amalgam. Many fillings supposed to be copper amalgams were not always so. If it were a difficult thing to secure a permanent filling he could understand men using copper amalgam, but it was very well known that it was a simple thing in the present day to select a material which should answer all purposes except that of colour. With the aid of the oxyphosphates a filling could be obtained which would give all the results desired. The vices of copper amalgam were first brought to his notice some twenty years ago, when he was asked if he had found it waste and wear away at the cervical edges. He said he had done so, and he concluded it was his own inefficient work ; but he was told that it was not so, it was the character of the amalgam, and he subsequently found that that was perfectly correct. If the use of it were not inculcated to the students of the hospital he should not feel quite so strongly as he did on the subject. One case in his own practice showed the extreme danger of using copper amalgam. A young lady came to him with the lingual surfaces of the four incisor teeth of the upper jaw filled with it, and she came because the teeth had begun to change colour throughout their entire surface. He drilled out the fillings, and to some extent got back the colour into the teeth and prevented further staining; but the other two were very bad indeed, and one became so black that it had to be cut off. He did not consider if a committee were appointed its time would be spent usefully, because it had already been appointed, namely, their patients and their experience in the past, and surely they had sufficient evidence before them to justify them in abandoning copper amalgam.

Mr. CUNNINGHAM thought every one would appreciate the motive of those who had spoken. Beginning, first of all, with the reader of the paper, he thought the point where Mr. Badcock touched upon the teaching in the schools showed very clearly that there was something wrong. Similarly he sympathised with the feeling which actuated Mr. Humby to say what he said, although at the same time he had to disagree with him. Copper amalgam was not an impostor, and he for one could not put copper amalgam away, but use it as he had used it already. To a very great extent he endorsed everything that had been said in the paper, except Mr. Badcock's conclusions. He had evidence before him that copper amalgam has lasted in certain cases from the years 1884-5-6, and he found in looking over the records that even at that time he was in the habit of lining the cavity with copper amalgam, and filling the upper part with an alloy of good edge strength. The point was that having found out copper amalgam possessed tooth saving properties, but was on the other hand weak in other respects, he adapted on the top of copper amalgam a good edge-strengthening alloy, and for many years he had been using the two in combination. Gradually he had been reducing the copper amalgam more to a lining, and had brought it up to the edge. He did not think any paper on amalgam should pass over such an important work as that by Professor Flagg in his investigations of plastic materials. With regard to the point of Professor Miller's theory, that the tooth saving was due to the germicidal character of the copper amalgam, that, of course, might be exaggerated, but as it was it coincided with experience. He agreed with the essayist that the physical quality was the greatest feature of the copper alloy. It had the great quality of maintaining its position and close adaptation to the wall. At the same time it would be admitted that if there were leakages, or if there were any cavity formed where the germs could obtain access, then a filling material which had a germicidal power was, other things being equal, better than the one that had not. He thought Mr. Goadby was under some great misapprehension. He did not know where Mr. Goadby had acquired the information about the copper salts and the question of green staining. He had himself never seen green staining in any cases he could remember with regard to copper amalgam. He had seen it in some teeth, and accounted for it there by the fact that the fault was with the dentist. He did not think Mr. Goadby had done justice to the experiments of Miller. He happened to be with Professor Miller at the time, assisting him in his laboratory in Berlin, when those very experiments were being carried on, and the use of the copper sulphate had nothing whatever to do with Professor Miller. It was entirely a suggestion of his (Mr. Cunningham's) own. It would be found in the record of the experiments where he filled teeth and tested the filling materials on the carious material itself. At his (Mr. Cunningham's) suggestion, Dr. Miller filled a tooth with gutta-percha and sulphate of copper mixed up together, and he got much more telling results than were produced from any of the copper amalgams. There was an enormous difference between the slight effect that was obtained with a gold cylinder on a plate culture, and that obtained by a piece of amalgam or a piece of carious dentine that had been under an old copper amalgam. With regard to the bouillon culture of Mr. Goady, Dr. Miller referred to the fact that bouillon was a material which was not a very satisfactory one for testing the antiseptic action of copper amalgam. But however they might differ, he was sure the members had great regard and high respect for the admirable investigations that had been given them that evening, and he was sure they were indebted very much to both the authors for the addition of scientific data they had put before the members.

Mr. HUMBY said that Mr. Cunningham had not been experimenting with copper amalgam at all, but with an alloy of two amalgams mixed together in the one cavity. He (Mr. Humby) was not condemning copper amalgam in conjunction with other things.

Mr. ROBBINS said he was one who thought that every material they had in their surgery had a use, and although copper amalgam played a very much smaller part with him than it had done formerly, he thought there were a few positions in which it might still be used. With reference to Mr. Cunningham's remarks he could not help thinking that Mr. Baldwin's method of lining cavities with oxyphosphate had an advantage over lining cavities with copper amalgam. The one great feature that had been emphasized in the discussion in favour of copper amalgam still stood, viz., that they very seldom noted shrinkage. He could not help thinking that the papers just read brought them up to date, and that there was a hopeful future, not only for copper amalgam having proper attention given to it, but for all amalgam fillings, owing to the scientific observation that was going on. He did not think there ever was a time when amalgam was treated so thoroughly as in the present day, and yet in our schools how little there was of direct teaching in this matter, either in the lectures on metallurgy or in clinical demonstrations. There were three eminent men, whose names were mentioned by Mr. Badcock in his able paper, Mr. Rogers, Dr. Perry and Dr. Darby—names that are associated with all that is sound and practical on this or the other side of the Atlantic—differing upon the question of copper amalgam, and if that were so, clinical observation was not enough. They wanted scientists to come in, and it was very gratifying to find that they had younger men in their midst with the capabilities of going into the matter, and he only hoped that the experiments which had been begun would be extended. There were still places, he thought, where copper amalgams could be used—for temporary teeth, for old, broken down shells of teeth that nothing else could be put in, or for very soft first permanent molars.

Mr. CUNNINGHAM said that with regard to the American aspect of the question he would ask Mr. Badcock not to lay too much stress upon the American opinions of copper amalgam. He did not think the American evidence was really strong on that subject. He still preferred the opinion of Claude Rogers, who was a great operator and a saver of teeth, and he still retained the use of copper amalgam in his practice. He regarded Dr. Perry and others as high authorities, but not on the question of copper amalgams.

Mr. J. H. BADCOCK, in reply, said that he agreed with Mr. Hunt's remarks as to the wasting of brilliant fillings, but he did not think that black fillings meant success. A black filling very often meant the reverse. In the dirtiest mouths copper amalgam had an intensely black surface, like a layer of soot, which came off when touched, leaving a brilliant surface underneath it. This was where a great deal of sulphuretted hydrogen was formed. Where there was less, the colour was not so intense a black, often a chocolate brown, and was not so easily removed. Fillings of this latter type lasted best, but, like all copper fillings, were unreliable, especially under the gum. Mr. Henry had spoken of mixing submarine with copper amalgam. He had tried that, but had not found it a success. In small quantities it retarded wasting, but did not cure it, and if more were added, change of shape, the fault of alloys occurred. Mr. Cunningham seemed to have forgotten that in the paper he stated that the only justifiable way of using copper amalgam was to use it coated, and that seemed the method Mr. Cunningham adopted. Mr. Cunningham had reproached him with omitting the name of Dr. Foster Flagg, but it would be remembered that Flagg's book was more than ten years old, and he had expressly confined himself to the last ten years. He quite admitted that if a filling were germicidal it was perhaps an advantage. He did not know if copper amalgam were germicidal or not, the evidence was contradictory, but he advised no one to lay any stress on its germicidal property. With regard to the cultures of Dr. Miller, he was not so fortunate as Mr. Cunningham to see the original culture plates. He saw pictures of them in the *Dental Cosmos*, and if Mr. Cunningham would look at those he would see the zones round the soft gold were precisely similar to the zone round the copper. He (Mr. Badcock) did not think it would be quite right to neglect American opinion because one did not happen to agree with it. He had tried to collect all the evidence he could during a certain period. What Mr. Robbins said about using copper amalgam for frail teeth and so on he could hardly agree with. It seemed to him that if they had a very weak, frail shell of a tooth, they got a stronger filling if they filled it with oxyphosphate coated with an alloy.

Mr. GOADBY also replied. With regard to Mr. Cunningham's remarks, tubes of bouillon were generally used in his laboratory for testing the effectiveness of an antiseptic, and many of those tubes in which discolouration had occurred were tubes with saliva taken as nearly as possible under the normal conditions of the mouth. On the gelatin and agar cultures he had found the green stain, and on making sub-cultures from that green stain round the filling he had got a distinct growth on the bouillon. As to the copper sulphate, at the close of the last meeting he had a little talk with Mr. Cunningham, after Mr. Baldwin's paper, and Mr. Cunningham assured him that he liked to see the roots turn nice and green on the application of his copper sulphate. Anyone reading Dr. Miller's paper would naturally infer from the remarks that he used his copper sulphate because he got a green discolouration from the tooth. He thought it had been the general idea of the profession that a copper sulphate had been formed from the filling. With regard to the remarks of Mr. Humby and Mr. Cunningham as to the value of clinical and experimental work, he thought the two ought to go hand in hand much more than they did, and he did not think it was fair to put one in front of the other.

The usual votes of thanks having been passed, the Society adjourned to April 5th.

MANCHESTER ODONTOLOGICAL SOCIETY.

At the Meeting on November 3rd, 1896, G. G. Campion L.D.S., Eng., President, in the Chair.

The following communication was read :—

An Electric Furnace for Crown Work.

By S. Mitchell, L.D.S.I.

Mr. Mitchell showed a small electric furnace for crown work, and explained its construction as follows :—Whilst attending the British Dental Association meetings in London last August he was very much interested in the two larger electric furnaces shown, and which, it was stated, consumed about 10 ampères each. It occurred to him that if a smaller one could be constructed suitable for crown work, which could be heated up quickly, and which would consume a smaller amount of current, it would be a great convenience to those dentists who could obtain their supply of electric current from the town's main.

When he got home he commenced to experiment, and had been so far successful that he felt justified in bringing the result of his experiments before them.

The total cost of the one which he had brought for their inspection was under 7s., and its construction was so simple that any dental mechanic ought to be able to construct one for himself. In the furnace here shown there was 3½ yards of iridio-platinum wire (20 per cent. iridium), ·008 inch diameter, known to electricians as No. 36 B.W.G.

To wind the wire he got a small brass tube, about $\frac{7}{8}$ of an inch in diameter and 4 inches long, on which he wrapped two layers of ordinary notepaper; over this he placed other four layers of paper from a strip about 1$\frac{3}{4}$ inches wide. On this last paper, which was placed about centrally on the tube, he carefully wound the wire, having first taken care to have a small stud placed at each end to secure the wire, and prevent it from slipping.

The wire must be carefully wrapped in such a manner that the three yards, which Mr. Mitchell had since found to be a suitable quantity for 110 volt circuits, or 98 inches for 100 volt circuits (as in Manchester, Leeds, &c.), shall extend over about 1$\frac{5}{8}$ inches or 1$\frac{3}{4}$ inches of the central portion of the tube, no two wires touching. The ends must, of course, be secured to the studs just mentioned, and he suggested that before winding the wire a preliminary trial should be made with the same length of ordinary sewing cotton. To form the body of the furnace, he had found it best to make a zinc die, 2$\frac{1}{2}$ inches long, 2 inches wide, and 2 inches deep; by the help of this die sheet copper could be easily hammered so as to fit the bottom and two sides, and also made to overlap the die, say $\frac{1}{8}$ inch at each end. The ends may be cut out of the same thin sheet copper, and $\frac{7}{8}$ inch holes made in them, so that they will just slip over the ends of the already wired and paper-covered tube. The top of the furnace must be made of Mica, about $\frac{1}{16}$ inch thick, or slate (ordinary schoolboy's slate will do), and must, of course, be 2$\frac{1}{2}$ inches by 2 inches, in which holes must be drilled at convenient places to hold the terminal or binding screws, and these must be secured to the top before the furnace is put together. It is advisable also, before finishing, to drill or punch a few small holes in the sheet copper of the body to allow for the escape of moisture. When the terminals have been fixed to the slate or Mica, a small notch should be sawn with a fret saw or dividing file from the edge of the slate to the terminals, to allow of the ends of the wire being easily fixed thereto.

The furnace is now ready for putting together. The ends must be slipped over the tube, and these again placed in the outer body, or shell, of the furnace, when it will be found that the coil of wire is in its proper position. Care must now be taken that the ends do not move or slip about, and this is perhaps best done by affixing them to the body by a touch of soft solder. The ends of the wire must then be released from the small studs, and temporarily fixed on the outside of the furnace body, opposite to where the terminals will come.

The investing material, which may be composed of powdered asbestos and plaster, equal parts by weight, is now put in somewhat after the manner of filling up a flask in vulcanite work. The top put on, and the ends of the wire permanently fixed to the two terminals, in such a manner that they are not liable to be accidently broken.

A piece of wire, or small strip of copper, must now be put over the ends, on the top of the Mica or slate, and fixed to the sides of the furnace, either by hard soldering or by drilling and putting in a headed pin or stud, about 1 inch long, so that the whole may be bound together.

The furnace must now be set aside to dry, and when all the moisture is driven out may be put over a Bunsen flame, and left till the paper which covered the tube is charred, when the tube may be easily withdrawn, leaving a depression in the central portion (formed by the four layers of paper), which must be filled in with a mixture composed of finely-sifted fireclay 1 part, pure silica 1 part, and china clay 1 part, made into a paste with water.* This must be allowed to become quite dry, when the current may be turned into the furnace by connecting the two terminals to the main current. If the instructions have been properly followed the inside of the furnace will in a short time become white-hot. The current should be left on for a few minutes, when it will be found that the lining of silica, &c., has contracted, and cracked considerably. It must be allowed to cool, the contracted portions gently pressed back into place, and the whole rubbed over with kaolin and water, either by means of the finger or a small camel-hair brush, which will fill up all the cracks, and when fired again it will become permanent. Should, however, the lining at any future time show signs of cracking use the kaolin and water as before.

The furnace is still open at both ends; it is only necessary to fill in one end to the depth of about half an inch with the powdered asbestos and plaster, and then cover the whole of the end with the sheet copper. The amount of current required to heat the furnace is 3 ampères at commencement, which drops down to about 2¼ ampères when it is fully heated. The falling off in consumption being due to the greater resistence of the wire when incandescent. No outside resistence is required with this furnace, which makes it more simple and also more economical, as all the current is utilized where it is required.

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* Further experiments have suggested the use of clay such as used by makers of clay pipes.

Demonstrations were given by Messrs. MITCHELL, DOUGAN, JOHN P. HEADRIDGE, and G. BRUNTON.

On December 1st, 1896, W. A. HOOTON, L.D.S., M.R.C.S., L.R.C.P., in the Chair,

In a discussion on the demonstrations performed at the previous meeting, Mr. Jones highly commended the furnace Mr. Mitchell had shown them, and of which they were to have a further demonstration that evening.

Mr. WHITTAKER thought the demonstrations performe dat the last meeting were all very instructive. With regard to Mr. J. P. Headridge's demonstrations, he considered a very perfect filling had been made, and one that would be a lasting one. He had not yet tried sponge grafting, but, encouraged by Mr. Brunton's success, he should do so. He suggested that as an experiment sponge grafting might be tried in such decayed six-year molar teeth that they happened to come across before the aspices of the roots were fully developed, and which they intended subsequently to extract. They would thus have some information as to what really happened in these interesting cases. Referring to Mr. Mitchell's furnace, Mr. Whittaker said he had experimented with it at his rooms, and it worked satisfactorily. On testing it he found that three ampères were used at the commencement of the firing, and later on as the furnace became heated, two ampères. He congratulated Mr. Mitchell on the power of his small but excellent furnace.

Mr. DAVID HEADRIDGE said they were deeply indebted to their non-resident members who gave them the demonstrations at the last meeting. He would like to ask how long it took to fuse the various bodies in the furnace?

Mr. MITCHELL: The Downie body requires about one minute, if the furnace is warm, and Ash's body two minutes.

Mr. SIMMS asked whether the material Mr. Mitchell had used for the construction of his furnace was likely to last under the strain of repeated heating. He suggested that the material Mr. Fletcher used for his various furnaces might be more suitable and lasting.

Mr. MITCHELL, replying to Mr. Simms, said he had found the material of his furnace somewhat friable, and since the last meeting he had used a material composed of plaster of Paris one-third, and powdered asbestos two-thirds, in bulk, and this he found superior to the former compound; also the ends of the furnace he had formed of slate, a circular aperture being cut into the end.

THE DENTAL RECORD, LONDON: APRIL 1, 1897.

THE TEETH OF HOSPITAL NURSES.

THE *Nursing Record* deals, in the leading article of a recent issue, with the question of the decay of nurses' teeth. It draws attention to the fact that quite recently "several most excellent and thoroughly trained nurses were disqualified from appointments to important posts in consequence of the unhealthy condition of their teeth." That "decay of the teeth is a sign of deficient stamina and of a constitutional predisposition to such diseases as consumption" and to "illness due to malnutrition." That "probationers during their term of training are most prone to suffer from decay of the teeth," and, finally, suggests, as a practical remedy, "that hospital committees should arrange with the surgeon-dentists of their institutions to give the necessary care and attention to the members of the nursing staff, as well as to the hospital out-patients. If each nurse on the staff had her teeth inspected every six months, and any commencing decay immediately dealt with, it would probably be the means of saving her the loss of many teeth and much subsequent ill-health. And it would certainly be more economical for hospitals to prevent such illness on the part of its nurses rather than to bear the expense of tending them in sickness."

All this is so true, and, indeed, so well-known to dental-surgeons of general hospitals, notwithstanding the *Nursing Record's* expressed doubt, that it has always appeared to us a wonder that remedies have not long since been adopted. And we have always been inclined to look for the cause in the utter ignorance so frequently shown in the value of teeth, not only by members of hospital committees, but even by members of the medical and surgical staff. It has not unfrequently fallen to our lot to watch a surgeon performing an operation with all the paraphernalia of modern aseptic surgery, yet assisted by a house surgeon, whose teeth, even to a casual onlooker, can be seen to be veritable hot-beds for growing micro-organisms; and by nurses whose dentition, on close inspection, will be found to consist of an ill-fitting, cheap and nasty denture—a poor attempt at beautifying—of a number of badly decayed molars; and under all a row of foul, festering, stinking roots. Yet the surgeon would have us believe that he is a rational mortal, of observing habits, and of scientific training! Again, we have known the hospital crowded; there are a number of special cases needing each a nurse; the matron is at her wits' end to make proper nursing arrangements, yet in one bed will be found a nurse warded for an alveolar abscess; in the dormitory another on sick leave for bad neuralgia, and scattered over the country several more invalided for ill-health not unconnected with the condition of the teeth. And, even if still able to go on duty, what is the actual value of a nurse whose attention is far too occupied by the constant gnaw of an inflamed periodonteum, or by the sharp stabs of an exposed nerve? This is really a serious question. The day of Sarah Gamp is supposed to be passed. Something more intellectual is needed of a modern nurse. But can the mind work at its highest level in an uneasy body, irritated by actual pain and disturbed by impaired digestive processes? And so far little has been done to provide a remedy; indeed, far too often, even when a nurse is willing and able, either to find gratuitous help, or to pay for such, she is prevented from availing herself of this by the conditions of her service. Either she actually has not the requisite time or has to use the short space, usually a couple of hours—and this often after being on duty all night—her only time to get a little exercise and such fresh air as she can in the neighbouring streets in some poor quarter of the town.

The remedy which the *Record* proposes is a practical one, *but*, in common fairness, the conditions of the office, which the dental-surgeon holds, must be modified. If it be his duty, and we hold it to be well that it should be his duty, to take reasonable care of the teeth of the nurses, then he should receive from the hospital funds some very adequate remuneration. The number of nurses is very large in the greatest hospitals, the work, therefore, would be also large, and would be an addition to the demands of the out-patient department, which already taxes his resources to the full. Moreover, a proper outfit must be provided with no niggard hand, and the day when this consists of a dozen forceps and a rickety wooden stool must pass away. Some, we know, have an objection to receiving a stipend for such duties. We hold this to be false sentiment. Can it be candidly said that, except in the isolated cases of wealthy men, the first motive in obtaining an hospital appointment, whether medical, surgical, or dental, is not a pecuniary one? We shall be told that there is a difference between obtaining a lucrative practice indirectly and actually being paid in money—

> " Strange all this difference should be
> T'wixt Tweedledum and Tweedledee."

Indeed, our chief fear would be that the remuneration offered would be so nominal as to be of but little value, and not, as it ought to be, such as would tempt a good man to hold the appointment for its intrinsic worth, and to give to it his best, his time, labour and his knowledge.

News and Notes.

HAROLD J. PICKERING, L.D.S.Eng., has been appointed Dental Surgeon to Felsted School, Essex.

AT an ordinary meeting of the Council of the Royal College of Surgeons, England, Mr. Davies-Colley was elected a member of the Board of Examiners in Dental Surgery.

It is with sorrow that we record the tragic death of Sibley W. Read. He was hastening to catch an early train, on his way to the National Dental Hospital, and to save time crossed over the metals. A light engine struck him down and killed him instantly. He was but 34 years of age, but had earned the high esteem of his colleagues at the National Dental Hospital and the gratitude of many students.

In reporting some cases of congenital teeth not long ago, says the *British Medical*, Dr. J. W. Ballantyne took occasion to point out that the fact that infants are occasionally born with one or more teeth already cut was well known to the ancients. Indeed, as he showed in a paper on the Teratological Records of Chaldea, instances of the kind are mentioned in the very ancient cuneiform inscriptions found a Ninevah. As showing the meaning which was ascribed to the occurrence, Dr. Ballantyne quotes the following passage from Holland's translation of Pliney's *Natural History*: "Certaine it is also that some children are borne into the world with teeth, as M. Curius, who thereupon was surnamed Dentatus, and Cn. Papyrius Carbo, both of them very great men and right honourable personages. In women the same was counted but an unluckie thing, and presaged some misfortune, especially in the daies of the KK. regiment in Rome; for when Valeria was born toothed, the wizards and soothsayers' being consulted thereabout, answered out of their learning by way of prophesie. That looke into what citie she was carried to nource, she should be the cause of the ruine and subversion thereof; whereupon had away shee was and conveyed to Suessa Pometia, a citie of that time flourishing in wealth and riches; and it prooved most true in the end, for that citie was utterly destroyed." M. Schurig, in his *Embryologia Historico-Medica* published in 1732, collected a number of cases recorded by other writers up to that time. Richard the Third, Louis the Fourteenth, Richelieu, Mirabeau, and Mazarin. Shakespeare refers in several places to this belief regarding Richard. Congenital teeth are rare. Of 17,578 infants born in the Paris Maternity between 1858 and 1868, only three had teeth, that is, not much more than one in 6,000. But Dr. Ballantyne has collected 70 records of cases from literature, and, he says, many may have escaped notice. In respect of sex, the female shows a slight preponderance, which, if there be any truth in Richard's theory of significance of congenital teeth, may perhaps be expected to increase with the evolution of the New Woman.

On Thursday, March 11th, a Conversazione was held at the National Dental Hospital and College, Great Portland Street, W., when the following Prizes and Certificates were distributed by Mrs. J. Howard Mummery :—*Dental Anatomy*—Medal : Mr. L. H. Canton ; Certificates : Mr. J. C. Wing and Mr. G. W. Storey. *Dental Surgery*—Medal : Mr. J. C. Wing ; Certificates : Mr. A. B. Poundall, Miss Halliday, and Mr. H. H. Gudgeon. *Dental Mechanics*—Medal : Mr. A. E. Relph ; Certificates : Mr. E. Tilly and Mr. A. Poundall. *Practical Dental Mechanics*—Certificate : Mr. F. H. Pearse. *Metallurgy*—Medal : Mr. C. Browne Thomas ; Certificates : Mr. A. E. Relph and Mr. A. B. Poundall. *Materia Medica*—Medal : Mr. J. C. Wing ; Certificates : Miss Halliday and Mr. L. H. Canton. *Operative Dental Surgery*—Medal : Mr. C. Browne Thomas ; Certificates : Mr. A. B. Poundall and Mr. J. C. Wing. *Histology*—Certificate : Mr. J. C. Wing. *Ash Prize*—Mr. J. C. Wing. *Rymer Medal*—Mr. C. Browne Thomas. *Students' Society Prize*—Mr. H. W. Moore. Mr. E. A. Johnson's band performed an excellent programme of music in the Lecture Room during the evening, whilst in other rooms the following entertainments were given :—Prestidigitation by Mr. Percy Cooper. Animated Photographs by Mr. E. J. Dale (late of the Alhambra.) Second-Sight Seance by Mr. and Mrs. H. C. Carter. Röntgen Rays by Mr. William Webster, F.C.S. In the Museum a number of Microscopical Objects were shown by Mr. W. H. Must. Most appropriately the Mechanical Laboratory was devoted to practical demonstrations on the action of teeth on various food stuffs, the latter being choice in quality and copious in quantity. Here, too, sundry liquids were provided, doubtless to emphasize the need of using "gargles" after food. A Concert in the Stopping Room on the top floor (under the direction of Messrs. Glassington and Beverley) was a great attraction, towards which Messrs. W. R. J. McLean (Mus.B.), Alfred Smith, W. Rushton, W. H. Wheatley Lewis Smith, John Clulow, W. R. J. McLean and Miss Rose Williams contributed.

Attention is being drawn to the fact that in preparing the site for the new Dental Hospital in Leicester Square, the removal of the old houses has disclosed, for the first time for about 200 years, a full side view of Sir Isaac Newton's house, a few doors on the east of St. Martin's Street, and marked with the plaque of the Society of Arts. The house is not particularly beautiful, for though once red-brick, it was plastered with stucco in 1849—a period of stucco. Originally it was the residence of the Danish Ambassador, and Sir Isaac Newton moved into it from Jermyn Street, St. James's, in 1710. Next door to it stands the old Huguenot chapel, for the district was a French colony even at that time ; and this chapel was afterwards celebrated for the ministrations of the popular Dissenting parson, Toplady. Newton's house, now devoted to mothers' meetings and mission work, has been put to many uses. In 1815 it was a second class restaurant, under the direction of a caterer named Pagliano, who had already opened Hogarth's house in Leicester Square, which has now disappeared, as a first-class restaurant, giving it the name of a celebrated old-time French cook, M. Sablonière. Pagliano's tariff at the Newton House restaurant was well within the means of the humble and economical citizen and the French refugee.

At a recent meeting of the Royal Botanical Society of London, the Secretary brought before the Fellows a number of plants producing the Indiarubbers of commerce, from the collection grown in the Gardens. He stated that there are now more than a dozen species of plants known which produce this extremely useful material, growing in different parts of the world, but invariably in the tropics. At the present time special importance attaches to the subject owing to the ever increasing demand, now chiefly on account of the great demand for tyres for bicycles and other vehicles. The price of Indiarubber has largely increased within the last few years, and must rise still higher as time goes on, since the supply is almost entirely dependant upon trees growing in a natural state, scattered here and there in dense forests, far away from towns and ports, and generally in a most unhealthy climate. In Central America, where at present the main part of our supply comes from, the ignorance and recklessness of the collectors—who wantonly destroy large numbers of trees every year for the sake of a greater immediate return—bids fair in a few years to put an end to the trade altogether in that part. The discovery of new sources of supply is, therefore, of great importance, and the fact that within the last few years Africa has been found to be the home of several species of rubber-yielding plants—not large trees, as in America, but quick growing climbers, easily acclimatized in suitable localities—comes most opportunely. The quality is good, and, as the plants grow over a large area, tropical Africa seems likely in the future to form our chief source of supply. Several species of these plants, known scientifically as Landolphias, are now growing in the Gardens, where they do very well in our greenhouses. The trade in India-rubber is one which has grown up within the last half-century Although rubber was used by the natives of San Domingo for making balls, waterproof shoes, &c., at the time of the discovery of America by Columbus, it was looked upon merely as a curiosity, and had no commercial use until 1792, when Dr. Priestley, the discoverer of oxygen, noticed its value in rubbing out pencil marks. It was brought at that time from the East and West Indies, and from the purpose to which it was applied, became known as "Indiarubber." In 1843 its usefulness was greatly increased by the discovery that it would absorb sulphur, and by this process, described as "vulcanising," became capable of withstanding high temperatures.

THE DENTAL HOSPITAL OF LONDON.

THE 39th annual meeting of the friends and supporters of this charity was held on Thursday, March 11th, at the Hospital, Leicester-square. Lord Kinnaird presided.

Mr. J. F. PINK, secretary, having read the advertisement convening the meeting, the report was taken as read. In this the committee congratulated the governor on the continued and increasing usefulness of the Institution. The total amount received for the general fund during the year was £2,238, against £2,226 in 1895. The donations of life governors during the past year for the general fund amounted to £368 as against £184 in 1895, while the general donations amounted to £39, as against £67 in 1895. The annual subscriptions amounted to £1,246, as against £1,121 in 1895, The Hospital Sunday Fund award was £124 and the Saturday Fund £44. The continued increase in annual subscriptions, being an addition to the reliable income of the Hospital, was gratifying testimony of the growing interest taken by the public in the Charity. While the committee had to express their regret that Sir Henry Peek, Bart., had, through increasing years and removal from town, felt himself unable any longer to act as a trustee, and the Hospital thus lost the active support and countenance of a friend of many years, they were gratified in being able to announce that Lord

Kinnaird had kindly agreed to serve as trustee, together with Mr. F. A. Bevan and Dr. Walker. For many years past the committee had impressed upon the subscribers the inadequacy of the existing Hospital to meet the needs of the annually increasing number of patients, and it had been their policy to secure a site for a new and larger Hospital on the land adjoining. With that object they had, as opportunity offered, purchased the contiguous buildings, and had now the satisfaction to announce that they had secured the whole of the proposed site, containing an area of about 8,000 square feet. The buildings thereon, having been condemned by the County Council, were cleared off, and the committee, seeing the urgent need of the Hospital for improved premises, had decided, rather than let the land lie vacant, to raise by loan the money necessary to start building. The designs for the new Hospital had been prepared by Messrs. Young and Hall, and the committee hoped that during the current year the building would be erected. During the year 1896, 57,654 cases had been attended to at the Hospital, many of them being treated for preservation rather than extraction. An earnest appeal was made by the committee for increased assistance to enable them to carry on the work, and also to furnish them with means for proceeding with the erection of the new Hospital so much needed.

The CHAIRMAN proposed the adoption of the report, which was seconded by Mr. Smith Turner.

The motion was carried.

Mr. MORTON SMALE moved the re-election of the retiring members of the committee, which was seconded by W. H. Ash, and carried, and on the motion of Mr. Hepburn, seconded by Mr. Hutchinson, Mr. Underwood and Mr. Matheson were elected as members of the committee.

Mr. MARSH proposed the re-election of Dr. Walker as treasurer of the Hospital. This was seconded by Mr. Walter Hills, who remarked that their worthy treasurer was content to spend and be spent in the best interests of the Institution, this was agreed to, and Messrs. Duncan & Co., Chartered Accountants, were elected Auditors for the ensuing year.

Dr. WALKER proposed a vote of thanks to the chairman, deputy-chairman, committee of management, finance committee, election committee, and medical staff.

The CHAIRMAN said he would like to have the pleasure of seconding that resolution. Regarding the small attendance he regarded that as proof that the subscribers were thoroughly satisfied with the way the Hosptial was managed. As to the staff, their excellence was so well known that he need not add anything to what Dr. Walker had said. The fact that the work had so increased that it was found necessary to do it in double shifts, afforded genuine proof of the skill of the staff and of the popularity of the Institution. On that point he could speak from personal experience as a governor who was entitled to a certain number of letters per annum, for he found that they all went very early in the year, and he hid not know where to get additional ones. He considered it a great honour to have been asked to become one of the trustees, and he would endeavour to forward the interests of the Hospital in every way he could. He hoped that in a few years they would meet the subscribers in the new building, for that would indeed be an important step forward.

The motion was carried.

Mr. STONEHAM proposed a vote of thanks to the Chairman for presiding. He said they welcomed Lord Kinnaird among them as a worthy successsor in the philanthropic work that his mother and father delighted to indulge in. He was sure that the association of his Lordship's name would be of great value to the Hospital, as it would afford the pubic a guarantee—if such was needed—as to the manner in which the Institution was managed.

Dr. WALKER seconded the resolution. and said that Lord Kinnaird as a trustee would inspire confidence when he told the meeting that his Lordship would take nothing for granted, but that he was a real and conscientious trustee, who did not shirk any labour in the interests of the Hospital.

The resolution was carried, and the CHAIRMAN, in reply, said that if the committee had simply wanted someone who would acquiesce in everything that was done, without making any inquiry, they would not have asked him to become a trustee. However, they were all agreed that the Instutition was worthy of all support, and anything he could do to conduce towards that end, he would be only too happy to do. He then announced that the committee had had the pleasure that day to acknowledge a further donation of £50 from the Clothworkers' Company towards the rebuilding of the Hospital.

Legal.

DENTAL PROSECUTIONS IN EDINBURGH.

EVIDENCE was led, in the Edinburgh Sheriff Court, on March 4th, before Sheriff Orphoot, on the complaint at the instance of William Broomfield Paterson, 64, Brook Street, London, F.R.C.S.E., L.D.S., hon. secretary of the British Dental Association, with concurrence of the Procurator-Fiscal, against Alexander Emslie, residing or carrying on business at 1, Rankeillor Street, Edinburgh, to the effect that he had contravened the third section of the Dentist Act, 1878, in so far as, not being a person registered under the Act, and not being a legally qualified medical practitioner, he had taken or used a name, title, addition, or description implying that he was a person specially qualified to practice dentistry by one or more of the following methods :—(1) By displaying since October last a signboard at his premises with the words "American dentistry" thereon ; and (2) by having a brass plate affixed to his door with the words "Dental Office" thereon. Mr. Dewar, advocate, appeared for the complainer, and Mr. T. B. Morison, advocate, for the respondent. After evidence to prove the existence of the signboard and brass plate had been led, Mr. Morison moved for a nominal penalty, contending that the offence was a very trivial and technical one, without any injury to the public. In reply, Mr. Dewar said it was no doubt a technical offence but one of a very serious kind, and a statutory offence very injurious to the profession. Not only so, but it might be injurious to the public. He did not think it would do to let the respondent off with a nominal fine, but he did not wish, at the same time, to be vindictive. The Sheriff imposed a fine of £3 3s. with £2 2s. of expenses.

In the same Court the Sheriff had before him a complaint in somewhat similar terms, against T. Tennant Black, 11, Marchmont Road, Edinburgh. It is alleged that he, not being a person registered under the Dentist Act, 1878 and not being a legally qualified medical practitioner, had taken or used a name, title, addition, or description implying that he was a person specially qualified to practice dentistry by (1) having his name, place of business, and scale of charges printed on cards, one of which he handed to James Crawford, 3, Crichton Place, Edinburgh, on or about 15th February, 1897 ; and (2) having between 12th and 15th February, 1897, above the door of his premises a gas globe with the words "Dental Office" thereon. The respondent pleaded not guilty, and the case was continued for a week for trial. When the case came up on March 11th, Mr. Peter Douglas, S.S.C., stated to his Lordship that he had advised his client to withdraw the plea of not guilty, and to plead guilty. The case against Emslie, which his Lordship had decided last week, was to be appealed to a higher Court, and it had been arranged with the Procurator-Fiscal that in the event of Mr. Emslie being successful in his appeal, any fine which the Sheriff might impose in the present case would be refunded. He might mention that the respondent had ceased to use the cards in question, and had removed the gas globe. The Sheriff imposed a similar penalty to that in the last case, viz., £3 3s., with £2 2s., of expenses.

Abstracts and Selections.

ACTINOMYCOSIS.

By Parker Syms, M.D., of New York City.

Actinomycosis is a specific infectious disease of cattle, which occasionally occurs in man. It is characterized by its long duration, by the formation of extensive granulation tumours, given the appearance of abscesses, but having a peculiar and characteristic hardness. These apparent abscesses when incised do not present large cavities, but a mass of granulation tissues traversed by sinuses. These are filled with a pus-like detritus, in which are found small yellow bodies or granules, which consist of colonies of the fungus or cladothrix which is the cause of the disease.

History.—To Bollinger, a veterinary of Munich, is conceded the credit of having first (1877) discovered and described the "ray-fungus" as constantly present in and as the cause of the disease called "lumpy jaw," etc., in cattle, although Hahn, and two Italians, Perroncito and Rivolta, of Pisa, claim to have discovered the fungus some years previously (1868).

Bollinger referred the specimens to the mycologist Harz. of Munich, who suggested the name actinomyces for the fungus, from the Greek *aktic*, a ray, and *mykes*, a fungus.

James Israel was the first to describe the disease in man as being caused by a fungus, but he did not discover the identity between this and the disease in cattle. He sent the foul smelling pus to Ferdinand Cohn, who accurately described the fungus.

Ponfick, in 1879, from the study of a case of human actinomycosis of the pleura and lung, comparing the findings with those sent him from Bollinger's cases, claimed the identity of the disease in man and animals.

Johne was the first to demonstrate by inoculations that the fungus was the cause of the disease in animals.

Etiology.—The essential specific cause of actinomycosis is ray-fungus. It enters the body with the food, as is shown by the fact that the disease is usually situated in the mouth or intestinal tract. It has been asserted that a solution of continuity is necessary for infection to take place ; and usually this is found to be the case, for the disease most commonly starts by lodgment of the fungus in a carious tooth, or a wound in the soft part of the month.

The argument for this assertion is that the actinomyces is too large to enter the tissue as true bacteria may, and that it must find a lesion in which to lodge and start the disease. The disease being established at one point may become widely disseminated through the body by metastasis. But Bollinger reported a case of primary actinomycosis of the brain, situated in the third ventricle. This was the only site of the disease to be found, and it would be begging the question to claim that this was a metastasis from some primary disease, say in the mouth, which had healed. It is more probable to assume that the disease may occur by entrance of the spores of the cladothrix, which are small, and may enter through an unabraded surface, and thus start the disease wherever they happen to find a lodgment.

In animals it has been found to have originated in the mouth by the penetration into the soft parts of a sharp piece of grain.

In Soltmann's case it was started by a bit of rye being imbedded in a boy's pharynx. And in James Israel's case an actinomycotic carious tooth became broken, and a piece was inhaled into the lung, where it started the disease.

It has been found that grain that has lain on damp ground, or that has grown on land reclaimed from the sea, as in the Netherlands, is frequently the seat of the actinomyces.

Of course, it may be conveyed to the food by the hands, &c., if one is in contact with diseased animals or people. One case is reported where a man, who did not work in the dairy, probably acquired the disease by drinking milk, some of the cows having the "mouth disease."

As to sex the disease is about equally distributed. It is rare in childhood, probably on account of the fact that it usually enters through carious teeth, and they are more common in adults than in children.

Partsch reports a case where it originated in the site of a new cicatrix. This was a case in which a breast had been removed for an ulcerating carcinoma. Skin-grafting was done. Two months after healing had taken place the scar ulcerated and abscess opened spontaneously, the pus containing actinomycetes. The disease could not be traced to any source.

Further and more general knowledge of this disease may prove it to be far more common than it is at present supposed. Mr. Archibald Park, in speaking of the human and cattle diseases in Australia, called attention to the mistake frequently made in confounding actinomycosis in rabbits and cattle with tuberculosis. He states that in Australia actinomycosis is, next to pleuro-pneumonia, the most common of the chronic diseases in animals. From my own experience it is fair to suppose that the disease is more often overlooked than recognised, and probably a great majority of cases are mistaken for some of the various diseases which so closely resemble it,—namely, tuberculosis, sarcoma, syphilis, pyæmia, &c. The disease is certainly a rare one, and many physicians of large experience have never encountered it. It has been my good fortune to have seen three cases, two in the jaw from carious teeth and one in the abdomen.

Biology and Morphology.—On this subject I shall have but little to say, for it belongs so essentially to the laboratory specialist. Actinomyces is usually classed among the mould fungi, or the lowest form of plants. It was so classified by its first discoverers and investigators—namely, Harz, Johne, Ponfick, &c., while others and perhaps later observers claim that it does not belong to this class, but to the highest order of bacteria,—namely, the cladothrix. (Affanassiew and Schultz, Bostroem, Israel.) In its most characteristic form, it consists of threads radiating from a common centre, terminating in blunt ends or clubs, giving the sun-burst or rosette appearance from which is derives its various names (actinomyces, strahlenpilts, ray-fungus, champignon actinomycetique). While this rosette represents the characteristic appearance, the microbe is found in various stages of development, and, consequently in a variety of shapes. We may in a specimen find merely the long threads interlacing or separated, or we may find the short clubs these again may be single pear-shaped cells, or where division is taking place, they may have the appearance of an open hand with the fingers apart.

Besides these threads and clubs, cocci are found which are capable of development into a complete colony. Mr. McFadyean describes the history of an actinomycotic colony thus :

(1) It has a starting point in one or more cocci.

(2) The cocci multiply by elongation and subsequent fission.

(3) The elongation of the cocci gives rise to bacillary forms, and through these to long filaments.

(4) Further extension is effected by continuation of this process.

(5) The formation of the club-shaped termini is evidence of the diminishing vegetative power of the filaments, and possibly of the cocci.

Others take a different view of the microbe, and claim it properly belongs to the still higher order—namely, the basidiomycetes. If this be so the clubs would not represent a stage of decline or degeneratión, but rather the organs of fructification of the fungus. This is rather borne out by the fact that daughter clubs are seen growing from the mature ones.

Inoculation.—Johne (1881) was the first to demonstrate the fact that the disease could be conveyed from animal to animal by inoculation of cattle. James Israel produced it in rabbits.

Max Wolff and James Israel made the first successful inoculation (in rabbits) from pure cultures grown on glycerin agar-agar, and upon coagulated egg albumen. In the peritoneum were found encapsulated masses, consisting of round cells and the colonies.

Cultivation.—In 1885, Bostroem made successful cultivations on coagulated blood-serum and agar-agar. In 1890, Wolff and J. Israel published the result of entended cultivation experiments. The ray-fungus will grow in both streak and stab inoculations. It can be grown in blood-serum, egg albumen, glycerin agar, etc. The colonies are matured in about six days, in the surface cultivation.

Examination.—Macroscopic appearance : When seen in the tissues or in the discharges, the fungus colonies give the appearance of small yellow granules about the size of a pin-head. These granules have been compared to small masses of sulphur or iodoform. They are a pale yellow in a reflected light, and a brown-yellow in a transmitted light. Those taken from animals give a gritty sensation. Those taken from human cases feel more like fat.

Microscopic.—The fungus may be examined by making sections of granulations, or by crushing this soft tissue between cover-glasses Or we may make cover-glass smears of the discharge. These should be dried by exposure to the air, and should not be passed through a flame, for the heat will destroy the characteristic appearance. Fresh smears may be examined wet. The fungus can be seen very readily without staining. Of course, proper staining will greatly aid one in making the investigation. I am indebted to my friend Dr. John S. Billings for the following directions for staining specimens of this fungus :

" The best hardening agent for specimens of actinomycotic tissue is absolute alcohol ; this should be changed several times. Embed the specimens in collodion and cut sections in the ordinary way. If paraffin be used, the masses of granules break down and escape. Should any calcareous matter be present the specimen should be put through a dilute solution of hydrochloric acid.

Staining Methods.—Gram's method followed by eosin as a contrast stain is probably the best for general use. Make a saturated aqueous solution of aniline oil by shaking together fifteen to twenty drops of aniline oil and eight to ten cubic centimetres of water; pass this through a moist filter. Add to this a few drops of a saturated alcoholic solution of gentian violet until a slight turbidity appears. Let the section remain in this mixture for four or five minutes, and then remove to a solution of iodine and potassium (iodide, 1; potassium iodide, 2; water, 300). It is to be left in this solution until the violet colour entirely disappears; this can be tested by bleaching in absolute alcohol from time to time. The section is then placed in a 0·5 per cent. solution of eosin in 70 per cent. alcohol for about a minute, washed in water, and then passed successively through 70 per cent. alcohol, absolute alcohol, and oil of cloves, after which it is mounted in Canada balsam. The actinomycotic filaments are stained violet and the tissue elements red.

"Weigert's process may also be used. The sections are first stained for about an hour in the following solution (Wedl's litmus solution): To 50 cubic centimetres of 50 per cent. alcohol add four cubic centimetres concentrated acetic acid, and as much French extract of litmus as will make the fluid of a dark-red colour; filter several times. The section of tissue, or cover-glass, is next passed through 95 per cent. alcohol, and is then stained for a minute or so in a 2 per cent. aqueous solution of gentian violet. The fungus threads are stained red and the surrounding tissue violet. A good stain to show the finer structure of the clubs is the Ehrlich-biondi triple stain. This is a mixture of methyl-green, orange, and acid fuchsin. The preparation of a satisfactory solution is so difficult that it is advisable to procure the stain in powder-form already mixed. It is sold under the name given above. A saturated solution of the powder in 20 per cent. alcohol is made, to which a few drops of glycerin are added. Sections remain in the stain for some hours, cover glasses only a few minutes. They are then washed in dilute alcohol and cleared and dehydrated as in Gram's method. Many other procedures have been recommended, most of them being based upon the use of ether and alkaline solutions to dissolve away the fatty and other detritus which surround the masses of granules. The specimens are then stained with some single stain such as eosin or fuchsin." While mycetoma or Maduro foot was originally described as a distinct disease, and is still so considered by many able observers, there is but little doubt that it is a form of actinomycosis.

Pathology.—Though actinomycosis is usnally attended by the ormation of pus, it is claimed by many and correctly that the ray-fungus is not a pyogenic microbe, but that the suppuration is caused by coexistence of the ordinary pyogenic bacteria.

How the misrobe exerts its influence is, of course, unknown, but when it has once entered the body and found lodgment for development it at once starts a characteristic form of inflammation of low grade, resulting in a remarkable production of granulation tissue, which is traversed by sinuses about a quarter of an inch in diameter, and honey-combed by small cavities. Embedded in the tissue and mixed with a detritus or pus are to be found the sulphur-yellow masses described above, consisting of the colonies of actinomycetes.

According to Firket, coagulation necrosis does not occur, but the first process is the establishment of a cellular hyperplasia. At first there are round cells. As the process of inflammation advances epithelioid and giant cells are plentifully found surrounding the colony. This production of granulation tissue results in the formation of extensive tumours, and if pyogenic infection is not added the disease will take on a more chronic form and be of the nature of a neoplasm rather than an inflammation. If pyogenic infection take place the disease will become more active, advancing rapidly, and breaking down through the formation of abscesses. Diffuse phlegmon may occur, but, as a rule, even when suppuration takes place, the abscesses do not form large cavities, but rather sinuous tracts, *and the disease should be suspected on account of the hard tumour-like feel to the touch, which is unlike the boggy sensation of an ordinary inflammatory swelling, also on account of scanty contents of the cavities. In fact, it always suggests a true neoplasm.*

As the transformation into granulation tissue occurs in the connective tissue, the disease will follow the intermuscular planes, and will often separate and expose nerves and large vessels, rendering profuse hæmorrhage liable. In pure actinomycotic infection, the lymphatics are not invaded, and this is not apt to occur even in pyogenic cases.

Metastasis is common. It occurs through the blood vessels by the transmission and deposit of emboli.

Of course, the anatomical character will be modified according to the organs and tissues invaded.

Bone.—Its most common sight is in the jaw (usually the inferior maxillary). Here it forms large tumours in the bone itself, extending to the periosteum, and it is often mistaken for osteosarcoma. There is frequently a sinus leading to the face or neck. This was the case in the two instances I have observed. The peculiar hardness of the tissues around the sinus and the presence of the sulphur bodies in the discharge furnished the points for clinical diagnosis.

If the disease extends from the jaw through the deeper places to the neck, it may clearly resemble angina Ludovici.

Lung.—In the lungs the disease is prone to suppurate and break down, forming sinuses into the bronchi and causing a fœtid expectoration. It frequently extends to the pleura and produces an actinomycotic empyema.

Vertebral and prevertebral actinomycosis are comparatively common. Here the disease is very widespread, and cannot be distinguished from tuberculosis of the vertebræ, except by examination of the discharge.

Brain.—The brain becomes the seat of disease either by extension from the superior maxilla or by metastasis. In one case cited above it was primary. It usually presents the character of a granulation tumour and of a brain abscess.

Abdomen.—Intestines: Here two varieties are recognized (*a*) catarrhal, where it occurs in the mucous and submucous layers in isolated patches, each presenting the characteristics of the disease; and (*b*) the parenchymatous form where it has extended to the deeper coats of the intestines, massing their coils together by invading the peritoneal surfaces. This is widespread, and usually extends to the abdominal wall, which is finally perforated with multiple sinuses.

From the intestine, any one of the abdominal organs may be invaded in like manner.

Zemann reported a case in which the right Fallopian tube composed a large abscess with no exit, the walls being lined with actinomycotic granulations. He also records cases where autopsy showed the disease as para- and perimetritic.

Langhans reports a case where the disease started in the appendix vermiformis. The principal disease was in the liver. The appendix was found in an abscess to the right of the bladder. The interior of the appendix showed old cicatrices of apparently healed "catarrhal" actinomycosis.

Skin.—Primary actinomycosis of the skin has been described by Hochenegg, Kaposi, Leser, Tommassli, and others. Here it very closely resembles tuberculosis, both clinically and histologically. It consists of a reddened, elevated spot which slowly breaks down into an ulcerating granuloma. It extends by formation of new nodules at the periphery of the primary lesion. The disease invades principally the corium ; the lymphatics are not invaded. It advances to the deeper parts by the formation of the characteristic sinuses.

Symptoms.—In an uncomplicated actinomycosis, that is to say, one in which a pyogenic infection is not added, the symptoms are really those of a neoplasm, and it very closely resembles the clinical picture of a case of sarcoma wherever situated. The disease is very slow in its development, sometimes extending over a period of several years. (In Kaposi's case, it lasted more than twelve years.) It is painless except from the effects of nerve pressure and stretching. It is afebrile. Perhaps its only evidence will be the existence of the granulation tumour.

However, the disease is nearly always complicated by pyogenic infection after it has existed some time. Whenever this occurs the course will be more acute, the extension more rapid, metastasis more common, and the symptoms will be those of both a neoplasm and of a chronic septic infection. Of course, the symptoms will correspond to the regions and organs affected, and it would take too much space for me to go fully into its clinical description in a paper of this sort, so I shall give a brief summary.

Alimentary Tract.—Mouth : This is the most usual seat of the disease, and it is commonly found in the lower jaw. Here it is found to have started in a carious tooth, extending to the jawbone and thence to the periosteum, and then to the soft parts. There is a swelling which may be mistaken for a slowly-developed abscess about the tooth-socket, or it may be mistaken for a rapidly-growing sarcoma. Sooner or later a sinus will form, and the softened mass will discharge its characteristic detritus either through the skin of the face or neck, or into the mouth cavity. The following is a typical case of this sort :

Senn. German, aged thirty years, general history and past history negative. No knowledge of having had any contract with diseased animals. He was a soda-water manufacturer by occupation. During the winter of 1886, he suffered from what he supposed to be an ordinary cold ; the right side of lower jaw was swollen and painful. One of the molar teeth being diseased was removed ; this did not relieve the pain and swelling, and all of the lower molars on that side were removed. Patient was admitted to the Milwaukee Hospital six mouths after the first symptoms appeared. At this time the lower jaw presented a fungus mass, extending from the angle to the first bicuspid tooth. The growth spread as far as the tonsil. The cheek was enormously swollen from the angle of jaw to the lower margin of the parotid gland. Skin over the swelling was pale and glossy. The superficial veins were considerably dilated. There was no distinct border line, the infiltrated parts fading gradually into the healthy margin. There was an adundant discharge from the granulation surface and from many open sinuses. Senn suspected the disease, and on examination found the actinomyces, clearing up the diagnosis. Excision of the mass was attempted, but was not successful, and patient died, from the continuation of the disease, four months after the first operation.

Intestine.—Here the symptoms may be very vague and indefinite till the disease has advanced considerably.

Pain seems to be an early symptom of the intestinal actinomycosis. The patient refers to the fact that he first suffered from severe lancinating pains or cramps in his abdomen.

Constipation and irregularity of defecation are the rule. If the fæces are carefully watched, the ray-fungus may be detected. After a time, as the disease advances, a tumour will be found either in the abdominal cavity or in the abdominal wall. If this be opened spontaneously, or surgically, the characteristics are found. When the disease involves the abdominal wall, it usually forms a number of fistulæ from the softening and breaking down of the multiple nodules which it produces.

These patients usually show a peculiar pallor and marked marasmus.

It is remarkable to note the fact that most of the cases of abdominal actinomycosis present sinuses below the level of the umbilicus only.

Typical Case.—S. Laache. Coachman, aged thirty-eight years ; always well till two years before he was seen by Dr. Laache. Then he had at first digestive disturbance, which was temporarily relieved ; also had persistent anæmia. Admitted to the hospital in November, 1888.

Increasing digestive disturbance causing abdominal pain ; vomiting ; later, slight nocturnal chills ; increasing emaciation and pallor ; constipation. Tumour appeared to left of umbilicus. Skin over tumour was at first normal and movable. Tumour was immovable and hard, evenly so, except at a point over the centre which was fluctuating. Other tumours appeared. They progressed in the usual way till finally the superficial fascia was involved, and then the skin. Principal tumour was incised and characteristic contents found. Patient died on February 23, 1889. Autopsy showed very general actinomycosis of the abdominal viscera. Disease was thought to have started in the appendix vermiformis.

Thorax.—Lung and pleura: Primary actinomycosis of the lungs may occur by the lodgment of the microbe in the bronchi.

Here the disease will present the clinical features of tuberculosis. Pyogenic infection is always added, and consequently the progress of the disease is rather rapid, and from the same we have the addition of septic symptoms — namely, elevated temperature and accelerated pulse-rate. Breaking down takes place, and the actinomycotic detritus, mixed with mucous and pus, produces a profuse fœtid expectoration. Proper examination of the sputum can alone establish the diagnosis.

Fistulous openings are always liable to occur. The disease is usually situated in the posterior and lower portions of the lungs, rarely in the apex.

From the lungs the disease spreads to the pleural cavity, and we then have an actinomycotic empyema.

From the thorax the disease is very prone to extend to the vertebræ and to the prevertebral region.

Brain.—Here the symptoms will depend on the situation of the disease rather than upon its nature. The symptoms will be those of brain tumour and of brain abscesses.

In Bollinger's case there were headache, optic symptoms, and attacks of lost consciousness.

In Keller's case the diagnosis was made during life. In the second year of an actinomycosis of the pleura, etc., the patient developed a left side slowly-advancing hemiplegia. This was finally followed by convulsions and by coma. Burger operated, opening an actinomycotic abscess in the right ascending parietal convolution. The operation gave almost complete relief temporarily, but the disease was not eradicated and the patient died within a year.

Skin.—Here the disease appears as an elevated nodule, red and hard. After a time this softens and breaks down by ulcerating in the centre. This destruction extends to the periphery and leaves a granulation patch, the exudate from which contains the actinomycetes. At the periphery will be found small nodules which consist of colonies of the microbe surrounded by the cellular hyperplasia described in the paragraph on pathology.

Cicatrization may occur, but after a time the disease will break out again in the same site unless the whole area has been removed or destroyed.

Diagnosis.—The only method of arriving at a positive conclusion is to find the characteristic ray-fungus in the tissues or in the detritus. *The presence of swellings which have the appearance of abscesses and yet have the characteristic hardness which, when opened, show very scanty contents as compared with the amount of diseased tissue, should make one suspect the disease. Added to this, the discovery in the discharge of the sulphur-yellow bodies should make one comparatively sure that it is actinomycosis. The demonstration of the ray-fungus by the microscope makes the diagnosis certain.*

Clinically and histologically it may very closely resemble both tuberculosis and sarcoma, and there is no doubt many mistakes are made on this account. An examination of the tissue alone is not sufficient, for this granulation tissue may be diagnosticated as sarcoma. My own experience has taught me that diagnosis of sarcoma, even by the best microscopists, is not to be relied upon.

As I said before, the diagnosis of actinomycosis can only be made when the actinomycetes are found. In cases where the tissue or detritus is available, the diagnosis is easily made, for the colonies are always abundant, and it is only necessary to make the proper investigation as detailed above; but the disease is so little known to the general practitioner that a thorough examination is seldom made, and consequently the majority of cases must pass unrecognized.

Since the discovery of the true nature of the disease, over four hundred cases have been recorded, and I am sure that these represent but a small portion of the cases that have occurred during that time.

Prognosis.—It is almost universally conceded that when the disease cannot be entirely eradicated by surgical means it is sure to end fatally. Some have claimed that the disease is curable by other means. Of this I shall speak under the head of treatment.

The disease has a slow course and may extend over a number of years. Its duration is very much modified by its situation and by the addition of pyogenic infection. In the abdomen and brain it usually proceeds more rapidly than elsewhere. When the disease is complicated by the pus-producing bacteria, it assumes a more malignant type and advances more rapidly than before, both by extension and by metastasis.

Unless some special cause of death arise owing to the organs involved, exhaustion and marasmus terminate the case. In chronic purulent cases, amyloid degeneration of the liver and kidneys is established and aids in bringing out the fatal result.

Treatment.—Nearly ten years ago, O'Neil stated that he believed that iodine, arsenic, and mercury exerted a curative effect in the early stages of the disease ; but he advised surgical ablation as the only treatment to be relied upon.

Thomassen, of Utrecht, was one of the first to strongly advocate the use of potassium iodide in actinomycosis. We have also the same testimony from a number of other observers. Lately from Italy and from France we have very enthusiastic accounts of the curative effect of this drug. Certainly, it should be thoroughly administered in all inoperable cases.

On the other hand, we have an immense array of testimony to the effect that surgery alone can produce a cure.

The disease is usually clearly limited by a distinct line of demarcation, and if one is ablating a diseased area it is only necessary to cut about half an inch beyond the apparent involvement. Infection of the operation field must be prevented by thorough cleansing and by the use of disinfectants.

Opening and draining an actinomycotic abscess is always attended by immediate improvement, sometimes by an apparent cure ; but the disease is never eradicated thus and will appear later. When a cavity is to be opened, its wall should be thoroughly removed by a sharp spoon and thoroughly disinfected by a strong bichloride of mercury solution, or by actual cautery.

Granulomata may be removed from bone by scraping, but it must be very thoroughly done.

When the knife is not applicable, destruction may be accomplished by means of caustics. Nitrate of silver has a very destructive effect upon the ray-fungus. Kottnitz reports the cure of four cases by freely plunging a solid stick in all directions through the granulations.

Billroth is said to have cured a case with tuberculin.

I am anxious to try the toxin treatment as applied to sarcoma. Such experiments might aid in throwing light on both diseases.

The following case of antinomycosis has recently been under my personal observation :

Rosalie Cohn, aged sixty years ; married ; Hebrew ; admitted to

Lebanon Hospital, October 24, 1894. Heart, lungs, &c., normal; urine, specific gravity, 1010; no albumen; no casts; no sugar; temperature 99° F.; pulse 80; respiration 20. Patient is emaciated and very pale. Has the appearance of one having a malignant tumour. Illness began four years ago. Her first symptom was pain, cramps in the lower part of her abdomen, after a time she noticed swellings in her abdomen. Later these softened in a number of places and were opened. She was for some time in one of our hospitals, but finally was discharged. She states that the doctors said she had the "sugar disease" (diabetes) and could not be cured.

Examination.—There are to be seen several scars showing that healing had occurred after the openings were made. She says that these openings gave her temporary relief, but that a swelling would soon appear at another place.

There were two fistulæ discharging scanty pus and detritus. These fistulæ were surrounded by peculiarly indurated masses, and it seemed as though the abdominal wall was occupied by several tumours.

Just above the groin on the left side was a swelling still larger than the rest; the skin over it was tense and glossy red. It was very hard on the margins, but soft in the centre. It looked like an abscess about to open spontaneously. The history of the case was peculiar, and the characteristic feel of these swellings made me suspect actinomycosis, so I pressed some of the discharge from one of the open sinuses and found in it the sulphur-yellow bodies. My friend, Dr. George T. Elliot, kindly examined some specimens for me and found plentiful colonies of the ray-fungus.

This patient remained in the hospital for about two months. She refused any extensive operative treatment. I opened the large swelling over the groin and scraped out the sinuses. At first this freshly-opened abscess discharged abundant yellow bodies, but after a time they became more and more scanty. I did nothing at first but open this swelling so that I could watch its progress. Though it seemed like a large abcess before it was opened, it contained very little pus and detritus. Instead of opening into a large cavity, as one would have expected, it was found to be more like a sinus with very thick walls composed of granulation tissue.

This patient's temperature was practically normal during stay in the hospital, once or twice I dammed up the opening so as to collect some specimens; this would cause a fever of one or two degrees.

Vaginal and rectal examination showed a mass high up in the pelvis.

She left the hospital on December 14, 1894. She had no internal treatment. One or two sinuses healed while she was there, and when she left the disease was certainly a little less active than when she came, but it was practically unchanged, though she felt better.

Since she went home, Dr. W. W. Van Arsdale, has been treating her with potassium iodide, and says that she has improved.

Note.—Eleven months after this report, the patient is in fair physical condition. The local process, however, has progressed and the number of fistulae is materially increased, so this case does not show that treatment by potassium iodide has any curative effect.

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DENTAL USES OF ELECTRICITY.*

By J. S. DICKIN, L.D.S.I.

MR. PRESIDENT AND GENTLEMEN,—In discussing the uses of electricity in dentistry I do not intent to deal with the various sources by which we can obtain the electric current; but confine myself principally to the advantages and uses of the various instruments which can be worked by the 110 volt main supply, as this is the one available in Liverpool.

To simplify matters I will class the apparatus into those used for "power," "light," "heat," or "medication."

Under the first we have motors of various kinds, of English or American manufacture. Their arrangements and power vary, though the principle on which they work is much the same; taste or requirement will determine the one to be chosen.

The advantages of a motor for driving a dental engine are that the operator is enabled to free himself from the tyranny of the treadle, and can stand firmly on both feet or sit while at work, with the steadier handling of the hand-piece, consequently saving the patient much discomfort.

The bur or other tool can be started and stopped at will, and its speed controlled as found necessary.

Engine mallets are also under much better command when driven by motor. In fact, every operation requiring a dental engine is more easily accomplished by these means than is possible with the older methods. The Bonwill Electric or Barners Skinner Mallets are "power" agents, and those who can indulge in the luxury of an assistant by the chair may find their requirements met by one of these instruments.

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* A Paper read before the Liverpool Odontological Society.

Good artificial illumination on dark days and in the evenings is a necessity which all recognise, and from experience of various kinds of light such as oil, oxyhydrogen and gas, I find none so efficient as the electric light, because, by means of a flexible wire, the current can be brought to where it is wanted and the light does not—if properly arranged—annoy either patient or operator. I use a "surprise pendant," with a "new improved sixteen candle-power glow lamp," the silvered portion acting as reflector, and with the front of the bulb frosted the glare from the filament is obviated. Used in this way, or in connection with a "Telschow," the light can be brought as near to, or pushed away from the patient as required, or it can be raised or lowered in a moment. The pressure of electric light in the operating room practically dispenses with the need for the "Electric Mouth Mirror," though this may be of occasional use in diagnosing pulp irritation. Provided electricity is for illuminating our working rooms, an improved condition of the atmosphere will be evident, compared with gas, as the light will not consume any oxygen or air, nor vitiate the atmosphere, and the heat given off is practically nil.

X Rays should find a place under this section, but I have had no personal experience of their application to dentistry. Some members of our profession have experimented with them, though, so far, without any great success. Could we apply the light as easily as the surgeon does it would reveal many a source of trouble, and no doubt prevent much suffering and annoyance. The inventive faculty which is often displayed by our brethren, will, I hope, soon be manifested in this direction.

"Electric Heat" is made serviceable to us through the medium of the Hot Air Syringe Cautery, Gold Annealer, and Furnace. Taking these in order we have in the first a ready means of producing warm or very hot air at will, and without matches or spirit lamp. The Cautery is useful in drying out roots—with suitably shaped points, and for subduing the sensitiveness of dentine in shallow cavities, also for trimming off gutta-percha fillings and even packing the same. The "Gold Annealer" is another time saver, it is in the form of a small oblong table, about five inches long, three inches wide, and two inches high, on which is laid the gold to be used and the temperature is speedily raised to the right degree and maintained without attention, rendering the gold beautifully adhesive with no tendency to overheat the edges. The Furnace has made the practice of continuous gum work a simple matter compared with the trouble and care required by the older methods of baking in coke furnaces. With one of the Electric Furnaces now on the market, the making of a crown or denture should be like a little recreation, rather than a piece of hard work. If the apparatus is fitted so that it is only necessary to move a switch, the current will immediately flow, and heat at once commences to generate, and in about half-an-hour the furnace may be allowed to cool. No smoke, no noise, smell or fear of gassings from bad coke or gas. The furnace is of convenient size, being but little larger than a Vulcanizer flask. The working expense is small, as sixpence per fuse cannot be considered excessive. In fitting up an electric furnace care must be taken that the leads from the supply are not less than No. 12 or 13 wire, or heating of the insulations may ensue and damage them.

Cataphoresis or Electric Medication has occupied the attention of dentists on both sides of the Atlantic for some time, and, from reports in the dental journals, is meeting with great success, though the instruments and methods of using them are not yet perfect. I have used the process in a number of cases during the past few months and can strongly recommend it to those who will take trouble to understand the practical and theoretical working of the apparatus required. The study of Dr. Lewis Jones's work on Medical Electricity and the *Dental Cosmos* for the past two years will amply repay the time spent in so doing. Cataphoresis has, in my hands, been successful in reducing pericementeum by the aid of an aqueous solution of iodine, also in bleaching teeth by peroxide of hydrogen, and for obtunding sensitive dentine through the agency of cocaine. In applying the current, care must be exercised so as to reduce the amount to a very small one, say one-tenth of a milliampère, and three to six volts, gradually increasing the current by reducing the resistance or increasing the voltage, the former is the better, as the possibility of shock is thereby reduced. When the result required is obtained, the current should be shut off quickly for the same reason. I have succeeded several times in reducing the extreme sensitiveness of dentine in five or six minutes with only six volts and half milliampère maximum. My apparatus consists of 20 Obach Q-cells, a double cell selector, reostat, milliampèremeter, and electrode. Those who wish to become proficient in the dental uses of electricity should familiarise themselves with the elementary science of the subject, or they will not be able to discover or remedy any fault which may arise. In conclusion, I will quote the words of Dr. Jack, "Electricity is a practical force in the treatment of dental caries. It is being successfully used for obtaining dentine sensibility by cataphorization, for the removal of caries and foundation of cavities, for packing and finishing fillings, and bleaching teeth by Cataphoresis."

" Dr. Custer says: "It would seem that electricity has given us all we could ask for, and yet I am forced to say that the properties and applications of electricity are just unfolding, and the demands of dental practice of the future will keep pace with, if not in the lead of electrical progress. It is not a dream when I say the time is coming when electricity will have its place on the dental curriculum as much so as materia medica or metallurgy has now. No profession, science, or art has such varied demands in its practice as dentistry, and no single agent more meets these than Electricity."

The foregoing remarks have been confined to continous currents but I must not omit to mention the alternatings, as for all purposes, except cataphoresis, I use such. Where a voltage is to be raised or reduced, the change can be brought about with lest cost and trouble by using the latter. My thanks are due to the Dental Manufacturing Company for the loan of various appliances to illustrate my paper, and also to Messrs. Ash & Sons for the use of the continuous current motor.

NEURALGIA.

By S. D. Corbett, B.A., Camb.

Mr. President and Gentlemen,—When I was asked to read a paper here this evening Mr. Woodhouse suggested that the subject of neuralgia would be suitable, being, as it is, a disease with which all dentists should be familiar.

The subject is so exceedingly wide that it would be impossible to treat of it fully, so that I propose to regard a little more especially neuralgia of the fifth nerve, so called tic-douloureux, considering shortly of the other forms.

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* A Paper read before the Students' Society of the Dental Hospital of London.

Anything I have to say must necessarily be theoretical, seeing that I have no practical experience of either the pathology, diagnosis or treatment of the disease. Neuralgia or nerve pain usually falls under two headings, first there is the so-called *symptomatic* neuralgia, in which there is actual disease of the nerve fibres; and *idiopathic*, where no such disease can be detected, and which is . . . . a functional disturbance only. As regards the etiology, it is a disease of adult life, as children do not as a rule suffer from it. It occurs more often in women than in men; it seems to be hereditary and to have a constitutional relationship to rheumatism and gout.

The Causes are many and various, for instance, they may be cerebral, due to syphilis, sclerosis, aneurisms or tumours, or toxic bodies may act on the nerve centres—toxic bodies such as lead. And it may also happen that the dura mater, which is pierced by the nerves, leaving the skull or the spinal canal as the case may be, becomes inflamed and thickened, so compressing those nerves and giving origin to the pain; indeed, the fibrous layer of the dura-mater forms sheaths for the nerves as they pierce it. Whilst ganglia, such as Meckels or the gasserian ganglion, may be the seat of chronic inflammation.

A frequent cause is the small size of the bony canals, both central and peripheral, through which the nerves pass, the lumen of which may become narrowed by the formation of new bone, as, for instance, after a fracture of the base of the skull or in syphilitic periostitis.

Children do not, as a rule, suffer from neuralgia, and the foramina in the skulls of children are, relatively speaking, large.

Then, again, the *nerves* may be affected by impaction of foreign bodies, pressure from tumours, carious teeth, or cold.

There does not seem to be very much known about the pathology of this disease; in the idiopathic forms, the nerves affected appear quite healthy under the microscope; in the symptomatic forms they may show definite sclerosis, and it may be interesting to note that in the so-called epileptiform neuralgia, which is neuralgia accompanied by epileptic symptoms, the nerves themselves do not appear affected so much as the arterioles by which they are accompanied. These show definite appearances of obliterative endarteritis, that is to say, that the lumen of the vessels becomes narrowed by the growth of a dense tissue, which consists of nuclei and fibres.

If we consider a typical case of tic-douloureux, the patient, who will probably be a female—a middle-aged female—will complain of severe attacks of pain, of an intermittent kind, on one side of the face; the severest pain being felt at the points of exit of the fifth nerve on to the face, namely, the supra-orbital, infra-orbital and mental foramina; the frequency and severity of the attacks becoming greater and greater, so severe that the patient will submit to any treatment, even the severest forms of operation.

The attacks are, as a rule, started by certain stimuli: such as pressure, cold, brushing the hair or the slamming of a door; the result being that in a case of true tic, the patient probably refuses to wash, and only eats on one side of the mouth, the other side and the tongue becoming coated either from disuse or from some trophic disturbance.

The continuance of the disease reduces the patient to such a nervous condition that slighter and slighter stimuli are sufficient to cause a paroxysm of pain. I believe that the pain of true neuralgia, to anyone who has not suffered from it, is quite inconceivable, and there are many stories which bear out this statement. A man who, I believe, was a doctor, was in such great agony that he first of all made long and deep linear incisions into his face and then seared them with the actual cautery. This is unrecognized treatment.

Dr. Ainstie has said that neuralgia is the cry of the nerve for blood, and sometimes, as you see, it is a loud cry.

Added to those symptoms already mentioned there are others, caused by the affection of the vaso-motor, motor and secretory apparatus; there is flushing, or, as it is called, unilateral hyperæmia of the affected side; this flushing or increased bloody supply leads to inflammatory swelling of the lips, cheek, side of the tongue and floor of the mouth, whilst it also, in part, causes the accompanying increase in the secretion of saliva, nasal mucous and tears, so that our patient looks as if she was weeping and drivelling.

Finally, there may be certain trophic changes in the skin, which becomes thin and shiny, whilst herpetic eruptions are occasionally seen along the distribution of the nerves.

Diagnosis.—The diagnosis of tic-douloureux is often attended with great difficulty; the patient may or may not have a previous history of injury or disease; the teeth are, of course, a frequent cause, and should be very carefully examined. And, again, the genital organs in women should be submitted to a careful examination by a skilled obstetrician, whilst the regularity of the menstrual flow should also be taken into consideration, as Dr. Gowers quotes a case in which the pain of neuralgia of the fifth nerve occurred *only* at the catamenial period.

Next comes into question the diagnosis between the central and peripheral origin of the pain ; one school maintains that in cases of central origin operations are unjustifiable, while other medical men consider that operative treatment in such cases is most certainly of use in that it cuts off the afferent stimuli, and thus gives the diseased centres the much needed rest.

Treatment.—When the diagnosis has been more or less satisfactorily determined, the treatment may be either medical or surgical.

There are great numbers of drugs which are supposed to be of use, and may be so in the milder cases, such drugs as quinine, arsenic, antipyrin, phosphorus, and, above all, *opium* ; the last named being the only remedy which is of avail in the severer forms, for which operative treatment is often the only cure. *Hypnotism* seems to have been used with some success in other countries : its success depending upon the fact—seen also as the result of morphia treatment—that prevention of pain seems to lessen the frequency of its recurrence.

The surgeon's treatment consists of either scarification of the jaw, division of the affected nerve, excision of a portion of the nerve, excision of ganglia, nerve stretching, or, as a last resource, ligature of the common carotid artery.

This last mode of treatment seems to have given relief in the most intractable cases, but it is only fair to state that in most cases relief was only obtained at the expense of the patient's life.

To give an instance of what a patient suffering from tic-douloureux will undergo, I may quote the following case :—The patient first submitted to scarification of the jaw inside and outside, next the supra-orbital nerve was excised, the pain came again and a portion of the superior maxillary division of the fifth nerve was excised in the spheno-maxillary fossa ; subsequently the peripheral segment of the same nerve was removed ; the pain then migrated to the third division of the fifth so that that nerve was excised in part ; still the pain recurred and the common carotid artery was ligatured, but with no effect on the neuralgia.

The patient further submitted to division of the facial nerve, and, profuse hæmorrhage having set in, the external carotid and temporal arteries were tied, with the happy result that the patient was cured.

Of the other varieties of neuralgia the commonest are cervico-occipital, cervico brachial—which often arises from excessive writing ; spinal column neuralgia, which is common after railway accidents, and it is exceedingly useful in obtaining damages from railway companies, as the pain passes but the damages remain.

Sciatica, a household disease, the pain of which is due to a variety of causes, such as intra pelvic growths, aneurisms, syphilis, narrowing of the great sciatic notch, and, more commonly, exposure to damp and cold.

I think I need only mention one other form, and that is reflex or sympathetic neuralgia, in which the distant pain has no *direct* sensory continuity with the permanent cause ; for instance, a man has a gastric ulcer, and the pain must be most severe along the spine ; a woman has some uterine trouble, and the pain is in the sacral region. In liver trouble, as some of us may know from personal experience, the pain is often referred to the angle of the scapula, and in renal colic there is pain in the testicle.

These pains are usually reflex, but occasionally persist after the cause is removed.

I have only just mentioned these forms of neuralgia, for to speak more in detail would be taxing your patience too much. It has been a great pleasure to read this fragmentary paper to you this evening, and I thank you for your kindness in listening to it.

Reports of Societies.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE Ordinary Monthly Meeting was held on the 5th ultimo, Mr. JOHN FAIRBANK (Vice-President) in the chair.

The Minutes of the last meeting were read and confirmed.

On the motion of the Chairman a vote of condolence with the family of the late Mr. Salter was passed. The President remarked that members who were as old as he was would remember what a very kind, genial man Mr. Salter was ; he was an F.R.S., and had contributed much to dental literature.

Mr. Hopson, as a Guy's man, referred to the esteem in which Mr. Salter had been held by the staff at Guy's Hospital, where he acted as Dental Surgeon for nearly twenty years, and read a letter from Mr. Clement Lucas to the same effect.

Mr. Kenneth W. Goadby signed the Obligation Book, and was admitted a member of the Society.

The following gentlemen were elected members of the Society. As resident members:—Russell Barrett, L.R.C.P., M.R.C.S., L.D.S.Eng., Charles W. Glassington, M.R.C.S., L.D.S.Edin., Joseph Lewin Payne, L.D.S.Eng.

The following gentlemen were proposed for membership:—E. Beltrami, M.D., Marseilles; Alfred J. Makepeace, Coventry; Rupert Wheatley, Torquay, L.R.C.P., M.R.C.S., L.D.S.Eng.

The Librarian (Mr. W. A. Maggs) announced the receipt of the Annual Report of the Smithsonian Institution for 1896, and also stated that Kingsley's "Oral Deformities" had been added to the Library.

The Curator (Mr. Storer Bennett) reported that the Society was again very deeply indebted to Mr. Morton Smale, who had, with great trouble to himself and advantage to the Society, obtained a number of specimens of comparative dental pathology which was enabling the Society to make a perfectly unique collection of specimens of pathology of the teeth in the lower animals. If the members who had opportunity would interest those of their patients who were going abroad to shoot big game he was quite sure they would get some very valuable additions to the specimens they already possessed. The first of Mr. Morton Smale's presentations, the skull of a bear, was interesting from the fact that two of the pre-molars had never erupted. A considerable amount of tartar existed on the right upper canine. The next specimen, the skull of a wolf, showed the results of death of the pulp and alveolar abscess in the case of the lower animals unable to obtain the benefits of dental science. In this specimen the two lower molars and two upper premolars had all lost their pulps, and alveolar abscesses had supervened, causing considerable destruction of bone; the pain the animal must have suffered during life must have been very considerable. Further, the right central second molar incisor in the upper jaw had been lost, the right central incisor having had an alveolar abscess connected with it, which was pointed towards the nose. The teeth had been lost considerably before death, and the sockets had been filled up by a deposit of new bone. Then there was another specimen of an animal which had suffered from alveolar abscesses. In the third specimen, the skull of a Cape monkey, the left upper central had had its pulp destroyed and an alveolar abscess was pointed to the nose. The right upper canine had been broken off short, so that the pulp in that case had been exposed and an alveolar abscess had also occurred. It was interesting to notice on the left side in the upper, the second pre-molar had been lost during life, and on the right side the first pre-molar had been lost during life. The sockets had been filled up by new bone being deposited. The last specimen was that of a young chimpanzee, just about the period of the changing dentition. The skull was soft from the animal during life having suffered from ricketts.

Mr. A. Hopewell Smith showed a new automatic microtome, the first, he believed, that had been invented by a member of the dental profession. The inventor was M. Choquet, of the Dental School of Paris. The instrument consisted of a base with an iron pillar and a moving table on which the razor or cutter was fixed. The object holder had a vertical action and the cutter gradually moved towards the object. The vertical movement reduced the amount of friction almost to nil, and the horizontal movement of the cutter gave a very steady motion to the razor. The microtome screw was at the base of the microtome and connected to the driving wheel by an eccentric lever. Sections varying from an 80th to 400th of a millimetre, about 2,000th to 10,000th of an inch, could be cut with the instrument, which was entirely new.

Mr. Howard Mummery thought it was a very beautiful machine, very much on the lines of the Minot. In the present instrument the knife moved to the object, but in the Minot the object moved to the knife. It was much more useful than the Cambridge Rocker, which only cut very small sections, whereas the present instrument would cut very large ones.

Mr. Storer Bennett suggested that by putting a hinge to the base the whole thing might be turned face downwards and so be available to cut celoidin specimens, which it was his practise to cut in a bath of spirit.

Mr. Goadby asked whether Mr. Storer Bennett always cut celoidin specimens in a bath of spirit, because in the Hume microtome the knife cut on the slant. He rather fancied that if celoidin specimens were cut in the way Mr. Bennett had suggested the advantages would not be so great as were got with a Hume microtome. Unless celoidin specimens were cut with a knife partially on the slant they were not properly cut.

Mr. STORER BENNETT said that with the Swift rocking microtome it was possible to vary the position of the knife to a very considerable extent.

Mr. A. HOPEWELL SMITH read a paper on "The Microscopical Aspect of Certain Lesions induced by Dental Caries." He said his remarks would be chiefly confined to the striking and important points of a patho-histological nature that are found in sections of carious teeth ; the main attempt being devoted to descriptions of specimens prepared by those decalcifying processes in which hard and soft parts are retained in close anatomical relationship. Caries was not the sole factor in the formation of calcarious masses in the pulp and on the walls of its cavity ; traumatism, senile changes and idiopathic conditions frequently shared in its production. Confusion of ideas would be saved if three kinds of dentinal deposition were generally recognised : (1) Calcarious degeneration of the pulp, a constant accompaniment of caries, but also found occasionally in sound teeth as the result of vascular changes due to idiopathic or constitutional causes ; (2) secondary dentine occurring not only as a pathological process in cases of attrition, abrasion or fracture, but physiologically, as the result of senile changes in both permanent and long retained deciduous teeth ; and (3) adventitious dentine, the the product of caries. Salter classified all forms of dentinal deposition as secondary dentine, and in a sense this was perfectly correct ; but the term seemed to require a more definite meaning, for under one head he described three forms, namely, dentine of repair, dentine excresence, and osteo-dentine, or intrinsic calcification of the pulp. Peripheral carious stimulation of the dentine was accompanied by destructive as well as constructive metamorphoses. At first the soft parts alone suffer ; the dentinal fibrils and their enclosing tubules, in parts of their courses, are affected and soon become disorganised, the blood vessels and tissues of the pulp undergo hyperæmic and other changes. Caries, even in its early stages, usually leads to a deposit of new adventitious dentine on the surface of the pulp, but later on bacterial agencies multiply and accumulate, advancement renders them still more potent, and development means destruction. For now not only do the dental tubules and matrix also become involved in the general dissolution, but any adventitious tissues that may have been developed rapidly break down and soon the work of demolition is complete. Mr. Hopewell Smith proceeded to consider his subject under the three heads (1) Conditions associated with superficial caries; (2) Conditions associated with deep caries; (3) Conditions associated with penetrating caries, and described with much minuteness the phenomena associated with each, illustrating his points with some excellent photo-micrographs. His study of the question lead him to the following deductions:—(1) That nearly every degree of dentinal change is attended with hyperæmia, and cell proliferation in the pulp tissues, and generally speaking, the formation of adventitious dentine. (2) That the latter may have its origin as a conversion or secretion of the dento-genetic cells, producing on the one hand the areolar or laminar or hyaline varieties, when the formative cells alone happen to be concerned; on the other the fibrillar or cellular forms when odontoblasts or connective tissue cells are by chance incorporated in the deposit; (3) That there are no proofs that the cells called odontoblasts take any part in the production of the matrix of the new dentines, the term being therefore a misnomer; and (4) That the new dentines, by a system of extension from the affected areas, may be just as much subjected to the peptonising action of micro-organisms as the primary dentine of the tooth.

Mr. Storer Bennett said that Mr. Hopewell Smith had asked them to take the suggestions that he had made and the classification that he had attempted for what they were worth; he thought most of the members would agree with him that they were worth a great deal, and Mr. Hopewell Smith was to be congratulated on his admirable paper. The author spoke of the extreme rarity of true bone being found in secondary dentine; no doubt it was very rare, or at any rate it had been found there rarely; but he might point out that Mr. Salter described and figured some specimens of true bone formed in the cavity of the teeth. In addition to the specimen described by Mr. Salter there was another one that Mr. F. J. Bennett had described and figured some years ago in the transactions of the Society, where absorption had taken place in the root and a deposit of new true bone had taken place also. So that there were three specimens on record of true bone being found in the pulp cavity of the teeth.

Mr. F. J. Bennett concurred in the congratulations offered to the author of the paper, but thought the paper perhaps would have been more enjoyable and more readily comprehended if photos had been thrown on a screen, so that the facts that they demonstrated might have been drawn attention to with a pointer. He thought too if the author had travelled over less ground and confined himself to grappling with one or two subjects more thoroughly it would have been an advantage ; for example, he would have been glad to hear more about the function of the odontoblast cells and a fuller expression of opinion with a demonstration of the ground upon which these opinions had been formed—he knew that the author held what might be called an extreme view on the subject—at any rate a view that was not universal. He did not quite follow Mr. Hopewell Smith's views as to the mode in which the intrinsic calcification masses were formed, the exact method in which the concentric globules were formed in the pulp. What was the exact method in which they grew, and in what particular did they differ from those masses of calcified substance which did not present the concentric lamination which Mr. Hopewell Smith had shown ? He understood the author considered that they had a different origin, a different method of growth. He thought Mr. Hopewell Smith had said with regard to the calcareous masses that they grew more in a manner resembling intra-membraneous ossification. He would like to know if the concentric masses were also supposed to grow in the same way.

Dr. Pare said that calcareous degeneration was generally considered as one of the remote causes of neuralgia ; in his opinion calcareous degeneration was extremely common in teeth where caries did not exist. He had seen calcareous degeneration in the centre of the pulp of a tooth perfectly free from caries that was extracted for regulation purposes. Whenever they had a case of neuralgia and could not find the cause they generally attributed it to some calcareous degeneration of the pulp, whereas calcareous degeneration frequently occurred without any apparent cause. In another specimen he had an instance of what Mr. Hopewell Smith described as adventitious dentine. It was a large mass of pure dentine going to the pulp and was somewhat predunculated, showing very well the secondary curves, but there was no caries anywhere near it, neither on the root, the neck, nor the crown of the tooth, so that it would seem that adventitious dentine was not always due to caries. In cases of caries where the decalcification had taken place rapidly, and the dentine was quite soft and lifted off in flakes, no adventitious dentine was present, which he considered was due to rapid decalcification, the pulp not having time to repair.

Mr. KENNETH W. GOADBY asked Mr. Hopewell Smith whether he found any phagocytes on the cells near the odontoblast in the early stages of caries. He was not quite sure whether he found micro-organisms present other than in acute caries.

Mr. HOPEWELL SMITH, in reply, said while he thought it was undesirable to disturb their dental nomenclature as much as possible, it seemed to him that the classification he had given was perhaps a little more clear than they had been accustomed to. If they restricted the term adventitious dentine to dentine produced entirely by caries they would pave the way to many things. With regard to the basal layer of Weil, that certainly existed in the specimens of which he had been speaking, and it seemed to him a very common accompaniment of hyperæmic conditions of the pulp. With regard to the fibrillæ he had called that fibrilla dentine. It was a curious thing that in the nodules of calcareous degeneration there were certainly tubes which one could not distinguish from ordinary dental tubules; but in that case as they as they had no fibrils it was perhaps best not to call it fibrilla dentine. He thought, certainly, the early stages of calcareous degeneration of pulp was produced in the same way that the intra-membranous ossification of bone was produced. He could not throw any light on the method of formation of the lamina varieties. He had not come across very many cases of lamina varieties, and he had only seen it in the later stages, but there was no doubt whatever about calcareous degeneration commencing in the form of ossification of connective tissue fibres by means of small cells round their edges. With regard to Mr. Goadby's question about the action of the other cells in the pulp, he had not particularly gone into it, but certainly the odontoblasts themselves had no phagocytic function. He had not seen any micro-organisms either in the cells themselves nor in the neuclea.

The usual votes of thanks concluded the meeting.

LIVERPOOL DISTRICT ODONTOLOGICAL SOCIETY.

THE Fourth Ordinary Meeting for this Session was held in the Medical Institution, Mount Pleasant, on Tuesday evening, February 16th, at 7.30 o'clock.

DR. WAITE (President) was in the chair, and there was a fair attendance of members and visitors.

The HON. SECRETARY read the minutes of the last meeting, which were confirmed.

The HON. SECRETARY read—for the President—an extract from the printed Proceedings of the Manchester Odontological Society, in which the President of that Society referred in a very kindly way to the formation of the Liverpool society.

The HON. SECRETARY also read for the President some extracts from an account of the discovery of the anæsthetic properties of nitrous oxide gas, by Dr. McManus, of Hertford, Conn., U.S.A.

The PRESIDENT then called upon Mr. Dickin, of Southport, to read his paper, entitled "Dental Uses of Electricity." (See page 193).

This very practical and useful paper was very fully illustrated by apparatus, &c., which he had been good enough to provide.

After a good discussion, carried on by Messrs. Waite, Pidgeon, Edwards and Gilmour, Mr. Dickin was thanked for his paper, and the meeting terminated.

DENTAL STUDENTS' SOCIETY, DENTAL HOSPITAL OF LONDON.

THE Ordinary General Meeting was held on Monday, March 8th, at 7.30 p.m., the PRESIDENT, Mr. G. F. Rilot, in the chair.

The minutes of the last meeting were read and approved.

On Casual Communications being called for—

Mr. QUINTON showed a case of an obliquely rooted upper molar, in which also the posterior buccal and palatine roots were fused.

Mr. BARTON brought forward a right maxillary molar with an additional root between the anterior buccal and palatine; they also showed some signs of absorption and were widely diverged, as if to embrace an erupting tooth.

Mr. W. JONES said a patient came to the Hospital this afternoon wishing to have a lower molar extracted (female, aged 22). From the history of the case I learnt that the patient had previously come to the Hospital, about 2½ years ago, suffering from an abscess in connection with the tooth. The abscess was treated, roots and crown subsequently filled, since which time the tooth has given continual trouble, the pain at times being more intense, and swellings were formed (abscesses? as patient said). The tooth was useless for mastication, the patient being afraid to bite with it; there being no opposing teeth and symptoms typical of periostitis being present, I decided to remove it. The specimen shows great absorption of the apices of the roots and the dressings protruding about a quarter-of-an-inch from same. As the gentleman who treated the case has long since left the Hospital the treatment he adopted, &c., is unobtainable.

Mr. D. Gabell showed (1) Model of the upper jaw of a man aged 23 years. On the right side the temporary canine is persistent and the permanent canine first bicuspid and molars are in a regular line, so that the whole arch is regular and unbroken. The second right bicuspid erupted in the palate and was extracted four years ago; also the second lower left molar from the same mouth. (2) Model of the upper jaw of a boy, aged nine years. The first upper bicuspid on the side has a large extra lingual cusp. (3) Model of the lower jaw of a girl, aged 23 years. Both second lower molars have an extra cusp in the mesio-buccal angle. All the other teeth are quite normal. The teeth in this last specimen very much resemble the tooth (Fig. 107) in Messrs. Smale and Colyer's book, described as a case of gemination of the molar with a supernumerary. I will pass this specimen round with the model as it has been kindly lent to the Museum by Mr. Colyer.

Mr. J. C. Douglas: I have to bring to your notice a peculiar case of sensation remaining in a (so-called) dead tooth. A patient whom I have been treating had the pulps of both bicuspids of the right lower jaw killed, and the pulp canals filled with gutta-percha points, some seven years ago. The cavities in the teeth were also filled at the same time. These fillings having come out on cutting away the carious tissue to put in fresh fillings, the patient showed signs of extreme sensitiveness when the neck of the first bicuspid was touched, more especially on the side approximate to the canine. This side seemed perfectly healthy. This was tested in several ways with probe, and heat, and cold. The other part of the tooth showed no sign of tenderness, and excavation of the cavity was completed without any pain. The gum had receded very slightly from the neck of the tooth. Application of nitrate of silver has given complete relief. Patient is a female, aged 35. In this case it would seem as if the nerves of the peridental ligament were continuous with the sense tissues (fibrils) in the dentine through the cementum. It may be worth while noting that in killing the pulp of a molar tooth for this patient three different applications of fibre had to be made, a small piece of pulp being removed before the second and third applications. She said that had to be done to several of her teeth.

Mr. F. MANNING brought forward a case of a broken bristle in buccal root of a first upper bicuspid. The patient was a student at the Dental Hospital. In 1894 the nerve of the tooth was destroyed and an amalgam filling inserted. Pain ensued. Iodine was applied to gum with no effect. At the end of a year the filling was drilled out, but nothing abnormal being found the tooth was stopped again. Pain continued and presence of a bristle was suspected. At the end of 1895 pain somewhat subsided, but recurred at beginning of 1896 and continued with pain over apex, especially on pressure. I drilled out the filling and explored the roots. Encountered some resistance in buccal root, which felt metallic in nature. By means of a spear-pointed drill I succeeded in dislodging half-an-inch of a Donaldson bristle. A dressing was applied and there had been no pain since.

Mr. W. B. WOODHOUSE related a case of perforation of the hard palate in a tall, healthy-looking woman, aged 46. The opening was about one-third of an inch by one-sixth of an inch in size, and would be seen a little to the left of the middle line of the mouth, and about half-an-inch anterior to posterior border of hard palate. The edges were smooth, fairly healthy, no discharge ; the tongue was furrowed, and a slight superficial scar was visible in the left cornea. About ten months ago patient attended St. Bartholomew's Hospital for soreness and inflammation where the present opening exists. Whilst under treatment two small pieces of bone came away through the left nostril, since which she had had no pain or soreness, only the inconvenience in eating, drinking and speaking. Patient was married. No children. No miscarriages. No history of sore throat, but, 25 years ago, had a very sore tongue, and some time after that she had what she described as "small-pox." Patient stated that her husband was quite well and had always been healthy—as far as she knew.

A short discussion on the Casual Communications ensued, in which the President, Mr. Green and Mr. D. Gabell took part.

The President then called in Mr. S. D. Corbett for his paper on "Neuralgia." (See page 196.)

In the discussion which followed the President said he wished Mr. Corbett had inserted the doses of the drugs in his interesting paper.

Mr. W. B. Woodhouse mentioned a case in which troublesome neuralgia was cured by removing tartar from the front teeth; and also the beneficial effect of arsenic in cases traceable to malaria.

Mr. Pinto said he was personally a great sufferer from neuralgia, and, in expressing his willingness to try any remedy, asked if Mr. Corbett could give him any information on the effect of some largely advertised remedies for neuralgia.

Mr. Wells said he had witnessed the removal of Meckel's ganglia and questioned whether such a severe operation should be resorted to with the chance of curing the disease.

Mr. Green, F. Morris, J. C. Douglas, and Dr. Gabell also took part in the discussion.

Mr. Corbett briefly replied, and the meeting was brought to a close.

Lockjaw caused by a Tooth.—Dr. Sache (*Centralbl f. Chir.*, 1896, No. 40) reports a case of lockjaw which for four years baffled the skill of several physicians. Dr. Sache found the right superior third molar projected externally in a horizontal direction pressing against the internal pterygoid muscle so that the patient was unable to open mouth. Eight weeks after the extraction of tooth patient could open jaws normally.

To Drill Holes in Glass.—Holes can be easily drilled in glass with an ordinary drill, if the spot is moistened with a few drops of a mixture composed of 25 parts of oxalic acid in 12 parts of turpentine. Keep tightly corked.—*Dental Practitioner.*

THE DENTAL RECORD, LONDON: MAY 1, 1897.

THE POOR LAW DENTAL OFFICIAL.

THE Board of Guardians of an important town, we read in the pages of a contemporary, has appointed a dentist, who is nameless, at an honorarium of ten guineas a year. Really if many such lucrative appointments are made we shall need some special laws to prevent dentists monopolising the wealth of the country. We would suggest to the holder of this post that he should request to be paid in bright new farthings. This plan would have the manifest advantage of enabling the recipient to have one brief glimpse of wealth, for though all is not gold that glitters, ten thousand and eighty bright farthings would make a respectable imitation. Besides, he could play for hours, counting and recounting, till they might seem what he would have them to be; for reality and fiction were twin children and are fond playmates. Moreover, our experience of the teeth of paupers would suggest that this most generous Board intended to remunerate their official at the rate of a farthing a filling, doubtless he to provide instruments and materials, so this lucky man might fill up his spare moments in finding the exact proportion of expenditure and profit which each of these little coins represents. With thoughtful consideration this is called an "honorarium," if it had been stigmatised a "salary" we could quite understand he must have winked with both eyes before he would have condescended to accept it. Happy thought! in future pay one's assistants a small fraction of their worth and call it "honorarium." But, perhaps, the appointment, to fit the reward, is also honorary, and the duties nil? happy man, but unhappy paupers. But to be serious, this is a sorry business. It is right and proper that the poor, if entitled to state or municipal help, should get dental aid, and this, too, not simply to tug out teeth, leaving the poor poorer still, but to save their teeth, to mitigate the hardness of their lot—not to increase it. But it seems to us that it is also fair that the services of the dentist should be paid for in some rational proportion to their value. The administration of the poor law is not the administration of a charity. It is supported by an enforced contribution paid by all, with some crude attempts to distinguish the ability of each to pay, and there is no more logical reason why the dentist should be expected to render voluntary services than there is for the medical officer, the borough clerk, or any other official. Personally, we cannot help feeling that the holder of such a post places himself and our profession in a somewhat false position, because he cannot argue by analogy with similar appointments to charities, he is the official, not of a charity, but of a rate-supported institution, which is supposed to pay for services rendered. The mere fact that the appointment carries with it a salary, however small, is proof of this. But this smallness necessitates his appointment being a farce, or else his remuneration is grotesquely inadequate to the work he does. We feel doubtful whether the holder of a post so paid is a good friend to his profession, for either he, by voluntary services closes what should be a means of earning a reasonable sum, and so creates a bad precedent, or else he accepts as sufficient recompense that which the hall porter would sniff at. It is an unfortunate dilemma, on which horn would it be right to impale this gentleman?

AT a recent meeting of the Council of the Royal College of Surgeons of England it was announced that the prize founded as a memoriam to the late Sir John Tomes had been awarded to Mr. C. S. Tomes. We understand Mr. Tomes has been elected a Vice-President of the Medico Chirurgical Society.

DEATHS FOLLOWING NARCOSIS FOR TOOTH EXTRACTION.

The following case of H. A. Hare, M.D., Philadelphia, illustrates the influence which nitrous oxide gas may have when administered to persons suffering from atheromatous blood vessels. A man between 50 and 60 years of age visited the office of a well-known dentist who makes a specialty of extracting teeth under the influence of nitrous oxide gas, in order that he might have removed one or two molar teeth which were giving him trouble. He had often taken gas in the same dentist's office before, and always without any ill effects whatever. On this occasion he took the ordinary quantity, his teeth were extracted, and he returned to consciousness with the usual rapidity. He left the chair and walked to a washstand and began to rinse out his mouth with water. While doing this he stated that his right hand felt numb, then complained of the extension of this numbness up his arm, and rapidly to his leg and side. He was helped to a sofa, where in a few minutes he became partially unconscious. When I saw him the attack had already been in existence about twenty minutes. He was breathing stertoriously, seemed to understand questions put to him, but was unable to answer them clearly, and in the course of a very few minutes passed into absolute insensibility, which, notwithstanding the use of venesection and other measures, deepened into a coma, in which he died about twelve hours after taking the anæsthetic.

This case is reported, not as a death due to the direct influence of nitrous oxide gas, but as an instance of the fact that the marked rise of arterial pressure which is produced by the administration of this drug during the period of anæsthesia may cause the rupture of a blood vessel in persons who have a tendency to apoplexy.—*Therapeutic Gazette, December*, 1896.

The Borough Coroner, H. A. Marlin, Esq., held an inquiry at the Windsor Royal Infirmary, on March 27th, into the death of Miss Julia Gath, a nurse in that institution, which took place on March 25th, during an operation for the removal of teeth. The inquest was held in the out-patients ward of the Infirmary.

Mr. Arthur Vernon Evans deposed that he was a registered surgeon and also a licentiate of the Royal College of Physicians. He was acting as *locum tenens* for Dr. Charsley, who was away on account of illness, and had been in the Infirmary ten days. During that time he came in contact with the deceased. She never consulted him with regard to any ailments, but she came two or three days previously to the Thursday—about the Tuesday—and asked for an anæsthetic, as she wanted some teeth removed. He wrote to Mr. Dainty, making an appointment for the Thursday, he being the honorary dentist to the Infirmary. On the Thursday, Mr. Dainty's assistant (Mr. Veysey) came. Witness prepared the deceased for the operation ; she had previously asked for the gas to be administered. There were present : himself, Mr. Dainty's assistant, the matron, and a nurse. Witness administered the gas. This was at three o'clock, and he administered afterwards about a drachm and a-half of ether ; then, when she was under the ether, he allowed Mr. Dainty's assistant to take out the teeth ; he extracted three. The deceased suddenly changed colour : witness immediately felt her pulse, and removed her from the chair to the floor. He commenced artificial respiration, gave her an hyperdomic injection of strychnine, rubbed her gums with brandy, gave her nitrate of amyl, and and also an inhalation of ammonia. All this time he carried on artificial respiration. He went on with this until about 6 o'clock the same evening, but without any effect. He also sent for assistance. He thought deceased died within about three minutes after the collapse. Witness sent for Dr. Gooch during the time he was endeavouring to restore animation, and he assisted him. Before administering the ether, he ascertained that deceased was a proper subject for it by feeling her pulse, and finding that it was quite normal, and that she was quite in a condition—as far as he could tell from external signs —to undergo the operation. He took the proper course in administering the gas and ether.

The Coroner : Is it usual to administer gas and ether as well ?—Yes, very.

Ether counteracts the effects of the gas with regard to the action of the heart, does it not ?—Yes.

Mr. Charles Ackland Veysey, assistant to Mr. Dainty, dentist, Windsor, stated that on Thursday, March 25th, an appointment was made for Mr. Dainty to attend at the Infirmary, but he was not able to do so, and witness did so for him a little later—just before three. When he arrived he found one of the nurses was to have gas, and after preparing the patient in the usual way, Dr. Evans administered it. Witness examined the patient's mouth beforehand to ascertain what was necessary to come out, and found a lot of bad stumps—at least four—and two bad teeth which required removal. She appeared to be in a proper condition, and not in the least excited or nervous. Dr. Evans applied the gas in the usual and proper way, and then applied ether.

Dr. Edward Casey, Windsor, said upon the warrant of the Coroner he made a *post-mortem* examination of the deceased on Friday afternoon. He found discolorations about the back and sides of the neck due to the condition of the blood, otherwise the body was in a perfectly natural condition. On examining the body internally, he found all the organs perfectly healthy; the blood was a remarkably dark fluid, the heart was flaccid and empty, the stomach was empty, the lungs were not engorged with blood, and these appearances went to prove that death resulted from failure of the heart.

The Coroner: You have heard the evidence of the doctor of the Infirmary and of the dentist; it appears that gas was administered for performing the teeth extraction, and also ether. Is it in your opinion that the gas had an effect upon the heart, causing failure of action?—Yes, I think the gas was probably the cause—that it paralysed the heart.

The ether would not affect it in that way?—No, the ether would not be the actual cause; rather it would tend to lessen the probability of death.

In reply to the foreman, Dr. Casey said he had never had experience of gas; he had used chloroform himself.

Dr. John William Dickson, B.M. and B.S. Camb., one of the anæsthetists at St. George's Hospital, and Professor of Obstetrics, also gave evidence.

The jury having considered their verdict, the foreman said they were of opinion that death was in accordance with the medical evidence. The jury were also of opinion that everything was done that could possibly be done by the medical gentleman (Dr. Evans), and they desired to express their sympathy with him, and also with the family of the deceased.—*Windsor and Eton Express.*

The Deputy-Borough Coroner (Mr. H. K. Pope) held an inquest, at Rockville, The Avenue, on March 9th, on the body of John

Lyons Horne, the ten-year-old son of Mr. Robert Benjamin Horne, manager of the Southern Counties Dairy Company, who died whilst under chloroform on Sunday during the extraction of some of his teeth. The Deputy-Coroner having briefly stated the facts, the father of deceased gave evidence of identification.

Mr. H. C. Corke, surgeon dentist, having stated that he had been attending deceased for his teeth, said that at about noon on Sunday he met Dr. Bencraft at the house, by appointment, for the purpose of removing some stumps The doctor administered chloroform in the usual way, and after about five minutes there was a little vomiting, which was usually the case, the doctor then administering a few more whiffs. Witness then removed four stumps, and on removing the fourth the child cried out a little, wherupon Dr. Bencraft administered a little more. There were then three other stumps to be drawn, when breathing ceased immediately, there being no sign of vitality after that. The doctor commenced artificial respiration at once, and kept it on for quite half an hour without avail. The operation was carried out with the consent of the parents of deceased, whose sister had previously undergone a similar operation with success. In answer to the Deputy-Coroner, Mr. Corke said it was impossible to avoid an occurrence of this kind occasionally. He had acted at quite fifty such operations with Dr. Bencraft, that gentleman being considered one of the best administerers of chloroform in the town.

Dr. RUSSELL BENCRAFT said he met Mr. Corke at that residence at twelve o'clock on Sunday for the purpose of administering chloroform to deceased. He first of all examined the heart and pulse, and considering it a fit case proceeded to administer it in what he considered the safest manner, viz., by sprinkling a few drops at a time on a handkerchief. The chloroform he used was Duncan Flockhart's, which was the best obtainable in the market. Witness used about two drachms, or 120 drops, for the whole operation. In answer to the Deputy-Coroner as to how much was usually administered to a child or adult, Dr. Bencraft said it varied considerably, some subjects requiring more than others. He had used as much as an ounce on an adult. He had previously given instructions, and he understood the child had had nothing to eat since eight o'clock on the morning in question. During the extraction of the fourth tooth the child cried out a little, and witness gave him a few more whiffs, in order that the operation might be proceeded with, when the child suddenly became pulseless. Artificial respiration was immediately resorted to and kept up for some considerable time, but without avail. Other medical aid was also procured, and Drs. Welch and Hall, jun., afterwards attended. The doctor also added that it was impossible to prevent such a thing happening, although he might say that the average of deaths whilst under chloroform was 1 in 3,300. The fact of the child crying out during the operation was proof that the dose was a light one. Death was due to syncope from sudden failure of the heart's action.

The Deputy-Coroner then briefly summed up, saying that he thought it would be clear to the jury that the death of deceased was purely accidental. Mr. Corke and Dr. Bencraft were well known and highly qualified in their professions, and he thought everything possible had been done in the case.

The jury unanimously returned a verdict in accordance with the medical evidence, and added an expression of sympathy with the parents of deceased.—*Southampton Times.*

Abstracts and Selections.

COATING CASTS FOR VULCANITE WORK.

PROCURE a quarter of an ounce of "collodion," add to this three quarters of an ounce of sulphuric ether, so as to thin the collodion down, and pour into the bottle containing these a package of "silver gloss."

Silver gloss is a preparation of tin and zinc and may be obtained of all dealers in paints, oils, putty and other materials for house painting. Though called silver gloss it contains no silver. It comes put up in papers of an ounce or more, in the form of an impalpable powder. It unites, to a certain extent, with the collodion, when shaken, and is applied to the face of the plaster cast, as well as to the reverse of the investment in a case flasked for vulcanite work, with a camel hair pencil, leaving a very even and thin film over these which effectually prevents the adhesion of the vulcanite to the plaster, permitting the case to come from the flask clean. The silver gloss may be had at slight expense, enough to last for a year or more with ordinary use. It should be kept in a well-corked bottle, and the pencil cleaned after each use. Should particles of it adhere to the plate, it can be entirely eaten off by immersing in a bath of nitric acid and water—one quarter acid, three quarters water ; but this we have not found necessary as it comes from the flask clean.—*Dental Office and Lab.*

MISFITTING VULCANITE PLATES.

By Stewart. J. Spencer, D.D.S., Harriman, Tenn.

I have sometimes remedied misfits in vulcanite plates by the simple process of warming them until somewhat softened, and then allowing them to cool slowly. This warming may be done over the flame, but better, I think, in hot water. Surrounded by water, the heat is, perhaps, more equally distributed through the plate than when it is held over the flame.

The theory is, that heat permits the plate to return to its normal shape—the shape given it by the model—if it has lost it.

It was celluloid which gave me this idea. Like many others, I was a victim of the celluloid epidemic of the '80's. One day, on boiling a celluloid plate to remove the teeth from it, I observed that it relapsed into nearly the original shape, that in which it was furnished at the depôt, the "blank." I then tried moulding the celluloid plates at a higher heat, about 300 degrees, if I remember rightly, and found that these plates would not, when afterwards softened in hot water, return to their "blank" shape, but (if purposely bent for the sake of experiment) would return nearly to the form given them by the plaster cast.

This suggested warming misfitting vulcanite plates to restore them to shape, if warped.

The process, however, fails in those dentures which have a new layer of vulcanite over an older one, as when an old plate has been refitted. I presume that the failure is due to the fact that, when subjected to this process, the older vulcanite draws in the direction given it by the original investment, and the newer in the direction given in the later investment, and that these two are opposed to each other. Indeed, I am disposed to believe that this opposition acts on these plates when cooling in the vulcanizer, producing misfits. It may be that this could be prevented by sawing out the entire palatal portion of the older vulcanite.—*Items of Interest.*

AN EXPERIENCE IN BLEACHING.

By Dr. FRANK FRENCH, Rochester, N.Y.

MR. P., age 46, came to me in the spring of '95 to have his teeth put in order. The right superior central had been dead for 15 years; was much discoloured; in fact, might be called black, and very unsightly. Discharge through fistulous opening most of the time, and of course absorption of purulent matter by tubuli. Tooth quite loose, and some absorption of alveolus on the labial surface. I regarded the case as almost hopeless on account of the bad colour and length of time, and told my patient so. The colour was the worst I ever saw, and in 30 years of practice I have seen some bad cases. I told him we could try, but my faith was very small. I did try, and very faithfully, to bleach it. After getting the tooth in as healthy a condition as possible, I tried our old remedies, Labaraque's solution, chloride of lime, tincture of iodine, and peroxide of sodium, but with very little effect. I have several times had very good results with peroxide of sodium, but no perceptible change could be observed from its use in this case. I also tried pyrozone 5 per cent. and 10 per cent. solutions, but no change. I had read of Dr. Meeker's experience with caustic pyrozone, 25 per cent., in bleaching, and resolved to try it. I adjusted the dam very carefully, so that there could be no leakage, for it is CAUSTIC—spelled with capital letters. I had previously filled the root from the apex one-half to one-third its length, permanently, so that there could be no leakage through the foramen. On top of this I packed a small pellet of guttapercha, so as to protect the filling from the action of the pyrozone; and if it did act on the guttapercha, it could be easily removed. I then prepared some slivers of compressed hickory, so that there could be no action of pyrozone upon metal, winding the end with a little cotton; dipped the cotton into the pyrozone and placed it in the pulp chamber, withdrawing the stick, and allowing the cotton to remain for one or two minutes; removed it, and with hot-air syringe dried out the tooth, then took another sliver of wood (never using the same one twice) and applied in the same way, using air syringe very thoroughly.

I continued this treatment for nearly three hours, and, although there was some change, I must confess that I was bitterly disappointed, for I had hoped for a great one. I told my patient that

I was disappointed, and that I wished to try again ; so I filled the cavity temporarily, and, making another appointment, dismissed him. Four days later he came to meet his appointment, and on my first glance into his mouth my surprise was so great that I could hardly speak. The tooth was bleached very nearly the colour of the adjoining ones. He said it began to change on the same day upon which I had bleached it, and continued to do so for 24 hours. The change was marvellous, wonderful! I applied pyrozone as before, and after half-an-hour the tooth was as white as desirable. I then filled the cavity with pure oxychloride of zinc, finishing with gold, and to-day the difference is not perceptible, unless one's attention is called to it. I am more than pleased with it, and the results so far are very gratifying.

Still I would caution all using it to do so with great care, lest unpleasant results should follow. It should be borne in mind that the great change in colour did not take place until some hours after the application of the pyrozone. The cavity should be thoroughly washed with a saturated solution of bicarbonate of soda, after using the pyrozone.—*Items of Interest.*

SECTIONAL BRIDGE FOR INCLINED TEETH.

J. A. Hanning gives his method in *Items* as follows :—This bridge is designed for cases where the piers lien, either together or apart.

One of the conditions on which success and usefulness depends is that crowns supporting the bridge should accurately fit the necks of natural teeth used as piers. If the sides of the natural teeth are not ground parallel, the pier crowns will be stretched in setting bridge, and will not fit at the gum margin. No amount of burnishing will secure proper adaptation. If the attempt is made to grind both to permit proper setting of bridge the pulps may be exposed and require removal, or both may become so sensitive that the patient will not submit to proper grinding. The device here presented will avoid all such complications.

The crowns should be made to fit the piers accurately, placed in position, and an impression taken with plaster of Paris. Place crowns carefully in position in impression and pour model. Remove impression, and pier crowns will appear on the model in their relative positions. Swage and fill in cups of bridge as in ordinary case. Make a dovetail of thin platinum.

This may be made with a small pair of flat pliers, or over a small, three-sided file, holding two thicknesses of platinum together. Be careful that the pieces of metal are held in absolute contact, and the result will be a perfect double dovetail.

Set the dovetail on model parallel with axis of either pier (anterior one preferred). Grind in and set facings, being careful to have the buccal edge of dovetail touch the backings of facings. Invest each portion of the bridge separately before removing from model, leaving portion of dovetail exposed. This will hold all parts in position, and permit separation at the dovetail. Cut away the model from the bridge and slide apart the sections at dovetail. Complete investment, add solder. Be especially careful that the dovetail of each section is thoroughly covered by investment, for if the smallest particle of solder flows on the surface, the sections will not go together.

The section in which the pier crown and the dovetail diverge must be set first. The other section, having the dovetail and the pier crown parallel, will slip to place without difficulty, thus avoiding grinding of natural teeth or multilation of the bridge. It is best to apply guttapercha or chloroform to the dovetail when last section is set, making a tight joint.

SILVER AND ITS SALTS AS SURGICAL ANTISEPTICS.

By Dr. B. Crede.

Dr. B. Crede, in an address delivered before the National Surgical Society of Germany, at its Twenty-fifth Annual Convention, held at Berlin, on May 28, 1896, discusses silver and its salts—more especially citrate and lactate, which are termed in Germany itrol and actrol respectively—as the surgical antiseptics of the future. We present an abstract of his address:

Dr. Credé begins by remarking on the impossibility of treating the entire subject with any degree of exhaustiveness within the necessary limits of his paper, and referring those who desire more detailed information concerning it to his treatise on "Silver and Silver Salts as Antiseptics," published by F. G. W. Vogel, of Leipsic, The observations of his father, made years ago, on the value of the nitrate of silver in the treatment of the inflammatory affections of the eyelids in infants, had led him to make a general inquiry into the therapeutic application and usefulness of silver and its salts. He found, however, that so far as wounds were concerned, he had no success with the nitric acid salt of the metal, on account of its chemical instability and its corrosive action on the mucous membranes. Nor did his trials with the argentic albuminoids, more especially with argonine, give any better results. While visiting the Johns Hopkins Hospital, in Baltimore, however, he was struck with the good results obtained by Dr. Halsted by the use of silver foil as an antiseptic covering for small or closed wounds.

In a subsequent series of experiments, made with his assistant, Dr. Beier, Credé proved that metallic silver, when placed upon aseptic sterile wounds, is non-irritating and remains unchanged, forming a thoroughly aseptic dressing. On the other hand, it appeared that when a wound or any part of it was infected, the products of bacterial vitality oxidized the surface of the silver, and, entering into combinations with the argentic oxide formed argentic albuminates which had powerful antiseptic properties. Credé and Beier succeeded in determining that it was the organic acids, and especially lactic acid, formed in the microbic secretions, that united with the silver oxide, and they proved that an infected wound, when dressed with metallic silver generated an antiseptic "lactate of silver." At Credé's suggestion the Chemische Fabrik von Heyden, at Radebeul, near Dresden, prepared a pure and absolutely stable lactate of silver.

Lactate of silver is a white, odorless, almost tasteless powder, permanent if kept in a brown glass vial, and soluble in fifteen parts of water and albuminous fluids. It has no irritating or corrosive action upon wounds, though in sensitive cases it caused more or less burning. In 1 : 1000 watery solution it destroyed streptococci, staphylococci, and the anthrax bacillus within five minutes. In blood-serum it retarded the development of bacterial germs in a dilution of 1 : 80,000 ; whilst corrosive sublimate does so only in a strength of 1 : 20,000. The destructive action of the silver salt on bacterial life is, therefore, four times as great as that of corrosive sublimate, as has been already noticed by Koch and Behring. And not only is corrosive sublimate far more poisonous than the silver salts, but it has the great disadvantage of forming insoluble compounds with albuminous sustances when applied in concentrated solution, whereby it destroys the cellular tissue and a further penetrating antiseptic action is prevented. Whilst the silver salts prevent the growth of the bacteria, they do not destroy the cellular tissue; they remain in solution, and the solution permeates the tissues layer by layer. The lactate of silver being absolutely non-poisonous, and both it and its albuminates remaining soluble, may be used hypodermically in the infectious diseases. Credé treated two hopeless cases of anthrax and five grave cases of erysipelas by the subcutaneous injection of a solution of lactate of silver He used ·5 : 20 (¾ grain to 5 drachms) of water for the anthrax and ·3 to 1 : 100 to 200 (5 to 15 grains to 3⅓ to 6⅔ ounces) of water for the erysipelas cases. All cases recovered. Encouraged by his success, he proposes to use this treatment in cases of septicæmia, pyæmia, puerperal fever, and diphtheria. The injection is somewhat painful and should be done under cocaine or general anæsthesia.

In veterinary practice a solution five times as strong may be employed.

Eight other organic silver salts were prepared by the Chemische Fabrik von Heyden for Dr. Credé in the attempt to obviate the irritant effect that the lactate of silver shows when employed in powder form, on account of its ready solubility. It was thought that on account of their close chemical relations to that salt they would have similar antiseptic properties, whilst, being less readily soluble, there would be less possibility of any toxic effect when freely used for long periods. Clinical and bacteriological experimentation both showed that the citrate of silver was the most efficient form of the metal.

Citrate of silver is a light, dusty, and stable powder, without odour and almost devoid of taste. It has the same antiseptic power as the lactate, but it requires three thousand eight hundred parts of water for solution. A watery solution of 1 : 4000 destroys all bacteria within ten minutes. It occasions no unpleasant or painful sensation at all in any wound, and its scanty solubility causes it to last longer and enables it to be employed in smaller quantities. It is, therefore, cheaper to use than iodoform, though its price is more than twice as great.

Credé has now used the citrate of silver for more than seven months, and has treated with it over four hundred surgical cases and over one thousand patients in private and clinical practice. He has, never observed any abnormal or detrimental action ; on the contrary, there has been a normal and rapid process of healing never before experienced with the former methods of asepsis and antisepsis.

Credé then proceeds to detail his method of treating wounds. Whilst recognising the desirability and value of an aseptic course of treatment, he rightly claims that the antiseptic one cannot be dispensed with, since many wounds come to the surgeon already infected, others are so situated that aseptic treatment is impossible, and a perfect aseptic treatment is only possible in a well-appointed hospital, not being practical in private practice, and still less on the battle-field. He has frequently observed in parallel cases that the process of healing was much more rapid with his antiseptic method than with the ordinary aseptic one, besides being less expensive on account of the relatively small amounts of material used. Chemical disinfectants are, it is true, going more and more out of use, probably because no universally applicable antiseptic is yet known. There is no one that is entirely devoid of irritating action, that is non-poisonous, that does not effect the cellular tissue unfavourably, that is odourless, that can be used as a powder and at the same time never fails to destroy the germs. He does not maintain that citrate of silver is such an ideal antiseptic ; but he does claim that we have as yet no better and no more perfect one at our command.

Credé's method of wound treatment stands about half-way between the aseptic and the antiseptic processes. After operation the wound and its surroundings are carefully and repeatedly rinsed with water. When the wound is closed it is first covered with silver gauze or with the "gray silver dressing," so called to distinguish it from the "white silver dressing" employed in minor wounds and transplanations. It is a mull impregnated with metallic silver in a most minutely-powdered form ; it is perfectly non-irritating, and forms undoubtedly a superior aseptic dressing. Its antiseptic action is initiated after bacterial infection of the wound and development of the lactate and other organic acids forming the powerful antiseptic, the lactate of silver. It forms a constant and prompt counteractant to any secondary infection.

Wounds that are not to be closed at once are first dusted with the citrate of silver and then covered with the silver gauze. Clean wounds and complicated fractures are thoroughly cleansed with soap and water and liberally sprinkled with the dry citrate of silver, without disturbing the process of healing by a minuter examination; the cavity is then filled with the silver gauze and the whole covered with the common sterilized gauze. Even if the infection is already deep, a certain amount of disinfection can be accomplished in this way, for the citrate of silver remains dissolved in the serum, penetrates the cellular tissues, and reaches the point of infection. A still-farther reaching disinfection may be gotten by using the more soluble lactate of silver, as in the cases of anthrax and erysipelas above mentioned.

For rinsing cavities, such as the bladder, etc., Credé uses the citrate of silver 1 : 4,000 to 10,000 of water ; but for abscesses where there is much pus and where an energetic action is required, he employs the more soluble lactate of silver, 1 part in 500 to 2000 parts of water.

It is a special gratification to him to be no longer obliged to employ iodoform, which is, apart from injections in cases of tuberculosis, but too often an unreliable and insufficient antiseptic.

Pure silver materials only must be employed whenever anything is to be left in cavities or wounds for any length of time. Where silver wire cannot be employed, silk, catgut, and caoutchouc ligatures covered with metallic silver is used, and drainage-tubes are similarly coated. They thus remain sterile, and any subsequent infection entering through the drainage tube or from the surrounding tissues is destroyed as long as the silver lasts. For the details of the preparation of these materials, as well as for the application of the citrate of silver in gynæcological, ophthalmic, aural, laryngeal, and genito-urinary practice, Credé refers to the larger treatise mentioned above.

In conclusion, Dr. Credé exhibited the following :—

1. White silver dressing.
2. Gray silver dressing.
3. Silk, catgut, and drain coated with silver.
4. Petri's disks, containing—(*a*) Silver upon agar-agar infected in sterile strata with staphylococci. (*b*) Gold, silver, and copper upon a similarly infected agar-agar plate. Gold has remained intact, silver is partly, and copper is entirely dissolved. (*c*) Staphylococcus culture upon agar-agar, upon which has been placed a trace of lactate of silver, forming large sterile strata. (*d*) Disk similarly

prepared and charged with a trace of citrate of silver, also forming large sterile strata. (*e*) Gauze, threads, and drains upon infected agar also forming large sterile strata.

5. Two drawings of silver with sterile surroundings infected with streptococci.

6. Citrate of silver and lactate of silver in dry powder.

—*International Dental Journal.*

A METHOD OF PREPARING CAVITIES IN ARTIFICIAL TEETH FOR GOLD FILLINGS.

By H. T. NORDAHL, D. D. S., Elgin, Ill.

THIS method is not intended to displace the diamond drill, but merely as an expedient in case a diamond drill is not at hand or the operator lives too far from a large city to send the tooth there.

My instrument consists of a round, straight small wornout plugger point, sharpened on a corundum wheel, in the lathe or any other means available. Sharpened to a diamond shaped drill or in the shape of a flat drill.

I temper this drill, or more rightly chisel, by holding over a Bunsen burner till cherry red and plunging directly in mercury. I then place the point in a Snow & Lewis, a mechanical, or an electric plugger. I now take the tooth to be filled and imbed it in plaster, leaving exposed the side to be filled. When plaster is hard, with a corundum wheel in the engine I grind through the glaze of the tooth, grinding as large a place as is desired the filling to be.

Then, dipping the instrument in campho-phenique, camphor or turpentine as a lubricant, I place it at one extremity of the ground place and work the mallet with a moderately hard stroke, turning the instrument continually to the right. Anyone who has watched a marble cutter chip a hole in marble will understand how it is done. I continue thus till a retaining pit, sufficiently deep and rightly slanted, is made. I then move the instrument to opposite end of cavity and continue. If care is taken to shape the chisel so it is slightly larger at its cutting edge than nearer its shank, it will very rarely split a tooth. Having obtained sufficient anchorage I proceed to fill with any gold desirable.—*Dental Review.*

CARIOUS TEETH AND TUBERCULOSIS.

Another channel of infection has been suggested in connection with the development of tuberculosis, namely, that of carious teeth. A paper upon this subject has been contributed to the *American Journal of the Medical Sciences*, by Strack, who records some interesting observations. Among 114 children with enlarged cervical glands, none of the ordinarily accepted causes could be traced in 41 per cent., and attention was then directed to the co-existence of carious teeth. The enlarged glands nearly always corresponded in position to the affected teeth. In many cases toothache had preceded the enlargement. In two cases positive evidence of the relationship of the disease was adduced. These were a youth of 18 years and a girl of 14 years, both healthy previously, and with no family history of tuberculosis. Enlargement of the cervical glands followed toothache. In the first case tubercle bacilli were found in the carious molar teeth ; in the other a suspicious-looking granulation was found between the roots of a molar, which, on section, showed tubercles with giant cells. This subject is well worthy of extended inquiry by those who practice largely among children.—*Medical Press.*

THE DECAY OF THE TEETH.

If the story told us by the prehistoric remains in our museums is to be relied upon, we may be sure that decay in human teeth has existed as long as the race itself. From the earliest crania we see evidences of carious teeth, and we may consider it to have been as extensive as most human ills. At the present time decay is perhaps as prevalent as ever before, caused mainly by the unnatural manner of living. Luxuries, mixed and adulturated foods, containing starch and sugar in excess, have much to do with it, for they are the principal ferment producers. The acids formed by these ferments decalcify the tooth structure, thus giving entrance to organisms, always present in the mouth, and these continue the work of destruction. The various views concerning the nature of decay of the teeth have undergone manifold changes in the course of the centuries which have elapsed, and it has waited for this—the era of bacteriological investigation—which has given to us facts, that makes its nature visible to all. So far back as the time of Hippocrates (450 B.C.) it is stated that the cause of decay was probably "the bad juices caused by stagnation." Galen and others state that trouble with food, lack of nourishment, makes the teeth weaker, and also say that the excess of food makes a sort of combustion, which causes decay. Then we had the inflammation theory, according to which, by means of an inflammatory process, first the lime salts of the tooth are dissolved and then the remaining basis substance liquefied. Such a theory is even to-day defended by some writers, in spite of the fact that the results of more recent investigators show it to be untenable. This theory is sheer nonsense, for there are, in every inflammation, elements which do not appear in the decaying process of tooth-tissue, and the cardinal symptoms of inflammation are not observed in dental decay. The causes and materials which always cause inflammation will not produce it in the matrix substance of the dentine, and then decay takes place in dead teeth as well as in living ones. Inflammation is a vital process. It can only be considered in living tissue. One can produce artificial decay in dead teeth, even outside the mouth, differing in no way from the natural decay, and this is a proof that external agents alone, without vital reaction of the tissues, are enabled to produce the complex symptoms of the disease. Representatives of the inflammation theory to-day are Heitzmann and Bödecker. They claim to have microscopically proved that a genuine inflammation of the dentine of the tooth is present very extensively even in places which have no connection with the tooth pulp or the pericementum. Through the inflammation the lime salts are dissolved, and the matrix or basis substance of the dentine liquefies, and there results a cavity, which may be filled with "medullary corpuscles;" if these latter fall to pieces, there results an abscess in the root of the tooth. If they take up lime salts again, then a *restitutio ad integrum* takes place. It is strange that these pictures which Heitzmann and Bödecker have seen and also drawn, could be confirmed by none of the many investigators of the decay of the teeth up to the present time. Another theory of decay we may call the worm theory, according to which small worms might destroy (devour) the substance of the teeth. This view was for a long time the current one among the earliest writers. Then there was the fermentation theory. Remnants of food fermenting between the teeth cause the teeth themselves to ferment, but it has been proven that the alkaline products of fermentation cannot attack a tooth. Then there was the chemical theory. This has followers, who consider that decay takes place as a result of inorganic acids, and those who consider organic acids as the cause of destruction of the tooth-tissue. But such inorganic acids are not present in the mouth. Organic acids, however, will destroy the teeth, so that macroscopically we are presented with a picture similar to the real decay, but which, by microscopical research, appears entirely different. The chemical theory is one which has obtained longest, even up to recent times. Thus, Magitot, Wedl, Tomes, Taft, Schlenker, and Baume, among the authors of the last three decades, were late followers of this theory. The chief part of the decomposition, besides that of the acids brought into the mouth in food and drink, is ascribed to the acid mucous and saliva, especially by digestive disturbances, wasted secretions, acid decomposition products, etc. Another theory was the parasitic theory, according to which parasites may be promoters of decay. Thus where Leeuwenhoek's "animalcula" accused in this direction (not by Leeuwenhoek himself, however). Erdl found a "parasitic vegetable;" Ficinus, infusoria, which he designated by the genus name of "denticola;" Klencke, his "zahnthierchen." The parasitic theory gained many advocates by the publication of the researches of Leber and Rottenstein. To leptothrix bucallis these authors conferred a particularly active *rôle* in the work of decomposition. The "elements" of the fungi present in every oral cavity multipy in the small tooth-canals in vast numbers, distending them, and thereby affording an entrance of acid into the depths, thus leading to the decomposition of the tissues. Indeed, it was believed that this fungus itself could bore through enamel, separate its prisms from one another, and then break it to pieces. The new theory was not at first generally accepted. It has continually gained ground, and has done much to prepare the way for the chemico-parasitic theory of Miller. Another theory was the electrolytic theory. In this the crowns of the teeth were electro-positive (Bridgman, Chase, and others); the dentine, electro-negative; and this, by the addition of moisture, produces an electrolytic dissociation of the mouth fluids, and the acids separated would result in decalcifying the tooth at the positive poles (the crowns). Since the tooth-tissues are non-conductors this theory is not at all tenable, as for the generation of an electric current both excitants must be conductors. There were various other factors given as causes of decay—mechanical injuries, fissures resulting from change of temperature, acid foods, excessive use of sugar, etc.—until the researches of Miller and his chemical parasitic theory brought to us the light and truth. Miller gives the result of his researches in the following statements: The decay of the teeth is a chemico-parisitic process, consisting of two significantly marked steps—the decalcifying or softening of the tissues and the dissolving of of the softened residue. The decalcification of the enamel means the total destruction of it. The source of the acids necessary for the softening of the tissue is not difficult to determine; they are the remnants of food containing starch and sugar retained in the cavities (fissures in the enamel, narrow cracks between the teeth, etc.), and which by fermentation form acids. The second step—the dissolving of the softened tooth-substance—is accomplished by fungi always found there. We have seen that many of the mouth fungi possess the power of dissolving or peptonizing albumen or albuminoid substances—*i.e.*, to change them into a soluble modification. We know that the dentine matrix consists of an albuminoid substance. Thus we have the explanation of the second step of tooth caries, especially as solution of the decalcified dentine by fungi may be directly proved and experimentally observed. Consequently, Miller lays special stress on the action of the ferment acids arising in the cavity, which hitherto only the acids brought in from without have been regarded as active in the process of decalcification.

Miller's theory is to-day recognised by the great majority of all authorities on dental science. There are only a few who believe in the theories of the last decade who uphold the formerly current combustion theory of the pure chemical theory, and who contest the work of Miller under the assumption that the presence of micro-organisms was purely accidental and had nothing whatever to do with the disease itself. Thus, Baume, especially in the newer editions of his "Lehrbuch," holds to the opinion that the fungi might luxuriate in the tissue undergoing destruction in the manner in which fungus elements luxuriate in decaying tissues. The bacterial fungi must be, therefore, the result of caries. Baume assumes four steps in caries:—1. The dentine becomes transparent; 2. Turbidity of the transparent dentine, as the result of softening; 3. Formation of pigment and great softening; 4. Cartilagenous dissolving and destruction. He states that only in the fourth step are fungi present.

As an advocate of the pure chemical theory, Baume seeks to prove that the acids alone may be sufficient to carry on the work of destruction ; in reality the characteristic microscopical changes in activity in caries cannot be explained as derived from the action of such acids. The picture under the microscope makes the presence of micro-organisms absolutely necessary.

It may be proper to consider these changes at some length. There is observed in the enamel at the places where caries is taking place, first a roughness ; the enamel has a whitish, cloudy appearance ; further, a softening of the enamel follows, and accompanying this complete disappearance of the same. It is decomposed to a white powder and a cavity results, the edge of which is more or less coloured brown. In general this decomposition of enamel goes on comparatively slowly up to the point when its whole thickness is destroyed, even to the dentine. In the dentine the process goes on more readily and also expands laterally, and, as a result, the enamel is attacked from the inside and broken down. The dentine is not like the enamel. It is not entirely destroyed by the decalcification, but there remains behind a cartilagenous mass—the decalcified basis-substance of the dentine (tooth cartilage). According to the rapidity with which the carious process continues, the part attacked takes on a diversified colouration (pigmentation)—that is, it remains white in the rapid form, but is light brown or black when the process has a more or less pronounced chronic course.

Microscopically, we see only the colouration of the edge in the enamel. In the dentine the canals appear greatly distended and filled with fungus matter, micrococci, bacilli, &c. ; in some cases a solution of the substance between the canals takes place, whereby neighbouring canals fuse with each other, and thus numerous small cavities result, which, merging into each other, soon settles the destruction of the tissue. The deeper layers of the decalcified tooth bone (dentine) are not so full of bacteria ; they are only seen here and there, so we may assume that the entrance of these proceeds with the dissolving of the tissues.

The decalcifying can naturally be accomplished by acids only, and on this account we may designate the decalcification as the first and the entrance of bacteria as the second step in caries. Caries of the cement-substance sometimes takes place on exposed cavities, which are found to be mostly without distinct edge or great depth. The decalcification and solution then goes on as in dentine. The canals of the cement become infiltrated with bacteria and broadened, especially the fibres of Sharpey and the cement lacunæ. The course of decay beyond this point is the same as with dentine—that is, after the disappearance of the walls of the canals the cavities join, a greater cavity results, and the dissolution of the tissue is made complete.

According to Miller the following are observed only as accompanying phenomena in caries : The transparency and pigmentation of the dentine, phenomena which have been earlier observed as characteristic of caries. (Baume and others.) If one looks at a section of a tooth in which caries is present in the first stages, he will see a conical transparent part in the dentine whose apex extends in the direction of the canals nearly to the pulp, while the base of the carious place lies on the surface. This transparent zone of dentine is not observed in dead teeth. It is present without the phenomena of caries in parts of the dentine upon which a chronic irritation exists, as, for example, the cutting surfaces that become deeply worn are subject to an irritation of a chemical or thermal nature to the pulp, and, as a result, we find there has been formed a transparent zone. Such a transparent zone sometimes appears in the dentine of the root. We must, therefore, conceive the transparency to be a vital process, by which, in consequence of an external irritation (especially acids), the tooth canals in the dentine are induced to an increased laying up of lime salts, so that as the outer surface of the canals change (calcified) these become narrower and the lumen of the canal is lessened. (Miller.) Under these conditions the dentine becomes more uniform, since it now consists only of hard tissues and not, as in the normal condition of hard and soft tissues, alternating with one and another. The homogeneity necessitates another index refraction of the light rays, hence the transparent zone.

The views concerning the nature of this phenomenon are still somewhat unsettled. While Tomes, Magitot, Walkhoff, and others stand out for the assumption of a partial calcification of the dentine canals, it is doubted by Wedl and others. Leber and Rottenstein, as well as Schlenker, seek the transparency in a partial decalcification of the dentine. According to Baume, it is produced by an obliteration of the canals, which may be caused by growth of basis-substance (dentine matrix). Wellauer puts forth the view that the transparency consists of a partial withdrawal of the lime contents of the matrix, either through periodical infiltration of the dentine canals with lime salts in solution, or by partial or complete calcification of the contents of the canals.

According to the views of some writers (Black, &c.), the pigmentation of carious tissue may be caused by the action of sulphur compounds, which may be formed by fermentation processes ; according to others, by direct colouring substances, as coffee, tobacco, &c. Pigment-forming bacteria are also accused in this direction. We may accept Miller's view that bacterial processes play the principal part here ; as every other organic substance which is decomposed by bacteria in course of time assumes a dark colour, the tooth-tissue does the same. The processes are supported by oxidation processes, for which the oxygen of the air is ready for disposition in plentiful amounts. Pigmentation always takes place also in sound dentine if this is exposed. We see it in the wearing away of the enamel on the grinding surfaces. The question now arises, Of what nature are the bacteria of caries? After Leber and Rottenstein the chief advocates of leptothrix buccalis, Clark, Underwood, and Milles, have been engaged with the study of these organisms. Clark describes his dental bacteria, which he found in carious teeth, as follows: They can easily be confounded with the vibrio regula or with the forms described by Cohn under the genus name of Spirochætæ or with spirochætæ plicatilis ; they have a hardly noticeable screw-like motion and, I believe, various forms. Their activity is heightened by the addition of acid. Without this they appear sleepy and lifeless. They are found nowhere in sound dentine. but sometimes in the deposit on the teeth. Vibrio regula and spirochætæ plicatilis, on the other hand, are never found in the canals of the carious teeth, which circumstance alone separates the dental bacteria from both these kinds. Miller could not confirm the results of Clark. He wrote concerning them : I have not found in the dentine canals the bacteria described by Clark, to which he ascribes the leading part in caries. This form occurs especially on the tooth and not in the cavities. The vibrios cannot exist in the canals. Underwood and Milles reported in 1881 that they had found various forms of micro-organisms, especially micrococci, small rod forms, and oval bacteria, short bacilli present in carious dentine; so, like the other inquirers of that time, they confined themselves to proving views concerning the nature of the micro-organisms involved by microscopical examination of the fungus masses contained in the dentine canals. Miller opposed the theory of leptothrix buccalis by the theory of a specific micro-organism of the mouth cavity which might produce all other diseases besides caries. He proved that the formations which Hallier, and after him others, had accepted as elements of leptothrix buccalis, which was represented as a fungus, could not exist in connection with this bacterium; that what had been considered as swarmspores of leptothrix buccalis, motile fission fungi of certain kinds, and that which had appeared as swarmspores in the resting stage, were cocci, as they are present in the mouth cavity in manifold forms.

It appeared that the iodine reaction described by Leber and Rottenstein could not be considered as characteristic of leptothrix, since Miller could prove that a variety of kinds of filiform fungi are present in the mouth, which show a beautiful violet colour with iodine and acids, and, moreover, that these filiform fungi, which give the iodine reaction, are quite clear and regularly jointed, while leptothrix is described as thin, long, unjointed threads.

The leptothrix appears to play only a secondary part in caries, according to the present ideas, since growth of leptothrix appears only on the layers of carious dentine nearest the surface (mostly decomposing), while the threads are not met with in deeper layers. From the deeper layers of carious dentine Miller was able (in 1880) to isolate five kinds of bacteria, to which, in view of the place where they were found, a close primary relation to carious processes could be ascribed. The first of these forms that he found were cocci and diplococci, found either simply or in chains; the second has several forms—cocci, bacteria, bacilli, and threads. The third form, very small abundant irregular cocci, seldom joined in chains. The fourth also occurs in the form of cocci, which show an extraordinary diversity of size. The fifth is morphologically most interesting of all. It occurs in short rods, with all variations from straight to semi-circular; it is also found joined in twos, forming a small S; also as threads, but more or less like spirilla, jointed or unjointed.

All these kinds seem to have the general property to set in fermentation solutions of fermentable carbohydrates, whereby lactic acid is produced ; and this acid has a very strong affinity for the lime in tooth-tissues.

By combination of the results which Miller has obtained concerning the properties of these five caries fungi and some twenty other mouth bacteria, he has formulated his view of the subject of the activity of these forms in regard to caries. Of the 25 kinds, sixteen were proved as able to form acids by fermentation of the carbohydrates. These might, therefore, come into the consideration of the first step in caries. The majority of all showed peptonizing qualities, which they would be able to use to dissolve the decalcified dentine and cement. Only those were considered as caries bacteria which were proved active in carious dentine.

After Miller, Gallippe and Vignal have been engaged to some extent with the study of caries bacteria, and they succeeded in isolating six different kinds. Four of these occurred in all the 18 teeth investigated, one kind only eight times, and one only five times. Like Miller, Galippe and Vignal had in their studies used only gelatin beside the liquid media in studying the life history of these organisms. More recently Professor Jung, of the University of Berlin, carried the experiments further by using solid media, which permitted treatment at the temperature of the mouth cavity.

Investigating in this way with 72 teeth, Professor Jung succeeded in isolating 10 different kinds of bacteria from carious dentine. Besides these 10 kinds, an eleventh was found ; however, not constantly, and he is not sure that it is an active caries fungus. There were always several kinds present in carious dentine at the same time, and we may consider it as settled that the decay of teeth is not due to a specific bacterium, but to a mixture of infection.

In dead teeth caries takes place with exactly the same phenomena as in living teeth. Caries may also be produced in artificial ways, differing in no way from the genuine caries.

Miller has proved that the phenomena of caries in animals are exactly like those in the human teeth.

There are only a few now who do not believe in Miller's theory. All recent authorities are working after Miller's ideas, and we may assume that questions concerning the nature of decay of the teeth have now found their final solution. There are other secondary phenomena, as revealed by accurate microscopical examination of carious teeth, that await a satisfactory explanation, as, for instance, the thickening of the so-called Neumann's sheaths, the appearance of the so-called pipe-stem formations, and the presence of granular elements (not vegetable) in the canals of the dentine.

The thickening of the so-called Neumann's sheaths in decayed dentine may, according to Neumann's assertion, often be so complete that the lumen may entirely disappear. Tomes allows only a partial obliteration, and Leber and Rottenstein dispute this, although they do not know how to maintain the fixed facts in regard to the thickening of the walls. Miller explains the phenomenon by the pressure of the collected bacteria masses in the canals, by means of which a compression of the wall-sheaths is brought about. That it cannot deal with vital processes is made clear from the circumstance that the phenomenon is also observed in dead teeth.

The presence of rows of shining irregular globules in the canals of carious dentine in early stages is considered by many as a vital phenomenon—an attempt of the pulp to oppose the progress of caries. The facts opposed to this are the appearance also observed in dead teeth. Tomes, Magitot, and others considered the formation as lime granules; Wedl, Black, and others as fat drops. The investigation leaves the field still open. Something not yet understood is the question relating to the so-called healing of caries, that rare phenomenon in which the decaying process comes to a standstill, and the carious, weakened dentine becomes hard again without any addition.

These are the facts about the primal causes of dental decay. The question, "What are the predisposing causes?" yet remains to be answered, and it is a field for much thought. It is not wholly hereditary, or faulty formation, that causes the dentine to become a culture medium for the fungi of the mouth. We know there are constitution factors at work, retarding the healthy natural vigour of the system, weakening the dental tissues as well. Women about to become mothers, people attacked by constitutional disease, overworked students in our schools and colleges, all these suffer much at such times from decaying teeth. A return to health retards and will sometimes stay the trouble. Are we not all familiar with a class of patients that have had a fine set of teeth up to the fiftieth or sixtieth year, who suddenly find their teeth troubling them and rapidly decaying? In such cases, in my own experience, and I remember several, it seemed impossible to arrest the trouble, and in two cases death followed in a short time. Impaired vitality from whatever cause has a very marked effect on the dentine, and under its influence it rapidly becomes a culture medium in which the caries fungi thrive; on the other hand, the exposure of the dentine from wear or from a break does not always end in decay. In health and vigour decay may become arrested by a natural process. Miller's work is a grand one, but we have much yet to learn.—*International Dental Journal.*

Review.

ARTIFICIAL ANÆSTHESIA. A Manual of Anæsthetic Agents and their Employment in the Treatment of Disease. By LAURENCE TURNBULL, M.D., Ph.G., Aural Surgeon to the Jefferson Medical College Hospital, Philadelphia; Late Honorary President to the Otological Subsection of the British Medical Association, and of the Section of Laryngology and Otology of the American Medical Association. Fourth Edition. Revised and Enlarged, with Illustrations. Philadelphia: P. Blakiston, Son & Co., 1012, Walnut Street.

Even in these days a new publication on the subject of Anæsthesia is welcome; but the fourth edition of "Artificial Anæsthesia," by Dr. Turnbull, is a disappointment.

The book is utterly without system, and the style is poor and at times wearisome, for he has re-introduced much that might with advantage have been omitted and has left out much practical matter which it would have been better to insert. For instance, some twenty pages (46-65) are devoted to descriptions of nitrous-oxide apparatus, which has been discarded in this country, whilst that of the actual administration of the gas is dismissed in the page following, in which we are surprised to find that the author still prefers (in our opinion) the objectionable method of inserting a mouth-tube and compressing the nose between the fingers. This last would not be tolerated by patients in England, where the face-piece is universally employed.

In attention to detail, the descriptions of apparatus appertain more to the catalogue of a surgical instrument maker than to a work on anæsthetics, thus: "The case is made of well-seasoned wood, lined with velvet and covered with leather, and the mountings are nickel-plated. A stout cast-steel ring, neatly japanned with a heavy set-screw, clamps the cylinder."

The text is even occasionally unintelligible, as the following paragraph will show—"This gas then enters the blood through the lungs and exercises a certain specific action upon the nervous centres. And here we have a ready explanation of an otherwise most anomalous circumstance, viz., that in a certain number of cases, persons evince the utmost toleration of nitrous-oxide and resist the Nepenthal action for a minute or more. Were nitrous-oxide purely an asphyxiant, we should invariably narcotize our patients when replaced by oxygen, but such is not the case—in fact, they are narcotized before this oxygen is exhausted."

The inclusion of therapeutics in a treatise upon anæsthetics and their administration is not a happy one—at any rate from the anæsthetist's point of view; and really in this work is found more of the former than matters of practical value for his guidance. Much upon the therapeutic action of drugs, which only with a stretch of the imagination can be reckoned among Local "Anæsthetics," is tedious.

Indeed, of some substances dealt with under this head, e.g., trichloracetic acid, aristol and naphthaline, no word is written on their actions as anæsthetics, analgesics or hypnotics. There are several pages upon acute carbolic acid poisoning, with illustrative cases; these, with remarks upon the use of eucalyptus in bronchitis, sulphonal as a hypnotic, and with the action of alcohol, immediate and remote, are of more interest to the general practitioner.

Had the book been written by various authors and edited by Dr. Turnbull the numerous and lengthy quotations (valuable as they are) would then have been less out of place.

We notice much repetition, for instance, under the heading "Nitrous-Oxide and Oxygen," several paragraphs of pages 95 and 96 appear again on page 123; and, again, part of page 298 and the whole of pages 299 to 302 are repeated word for word on pages 325 to 329.

Dr. Turnbull, in his zeal to treat his subject as thoroughly as possible, often wanders into side issues which have but little practical bearing upon the subject in hand ; for instance, on pages 111 and 112, under the heading "Administering Nitrous-Oxide to Children," we find an abstract from a French law in reference to unqualified persons.

For a recent edition the book is certainly not up to date ; the article on Rectal Etherisation is all too incomplete, and the description of nitrous-oxide and oxygen is entirely quoted from Dr. Hewitt's paper of 1894, no further observations being added by the author of this book. Finally (on page 114), in the description of a death under gas, which occurred in 1892, he still says that "Coroner Ransom *will* hold an inquest &c."

The article upon the relative merits chloroform and ether is most useful, and we cannot too strongly endorse the author's opinion that the administration of an anæsthetic demands the undivided attention of the administrator, and that, wherever possible, this work should be left in the hands of specialists.

The dangerous depression and cyanosis, which Dr. Turnbull lays stress upon as occurring during the administration of ether, and which, he considers, calls for inhalations of oxygen, is very rarely met with in this country. This latter treatment, however, is, in some cases, of great value in hastening a patient's recovery and in preventing vomiting.

The work contains the results of many valuable experiments, among others those upon the ultimate action of ether and chloroform upon the organs and tissues of the body.

To return to the chapter on "Local Anæsthetics," the value of eucaine hydrochlorate is somewhat overrated, for the drug has already been almost discarded by some surgeons, who have reverted to cocaine. Many other substances might well be excluded from the list, their anæsthetic qualities being of such infinitesimal value. We are also of opinion that there is wide scope for electrical osmosis, and more upon this subject, we feel sure, would have been welcome to his dental readers. Schleich's infiltration anæsthesia by means of cocaine we think unsatisfactory, and wearisome both to patient and surgeon, and not to be compared, for small operations, with the general anæsthesia of nitrous-oxide with oxygen ; but "central" anæsthesia Dr. Turnbull seems to avoid wherever possible.

The work would have been of much greater value and guidance had the author, whose knowledge of the administration of anæsthetics is wide and varied, given us more of the results of his own observations, experience in practice and of the methods he himself employs.

CORRESPONDENCE.

[We do not hold ourselves responsible in any way for the opinions expressed by our correspondents.]

TO THE EDITOR OF THE "DENTAL RECORD."

2, King's Parade, Cambridge.

Dear Sir,—I trust you will allow me to take up a small a mount your valuable space in order to bring before your readers' notice the of possibility of doing a service for the widow of our esteemed and lamented friend, the late M. Paul Dubois, whose sudden and tragic end last Easter must be fresh in memory.

The Dubois Memorial Fund, so freely subscribed to by his many friends, has sufficed to complete the furnishing of the charming country house he had just built and to provide a small annual income for the widow and her family.

As the income is very limited, she is anxious to increase it, and so to be enabled to make a better provision for her children. With this object in view, she has decided to let a part of her house to English visitors wishing to reside for a time near Paris. Her house is delightfully situated on an elevation about 100 yards from the river, at Chatou, 50 minutes from Paris on the route to St. Germain, which is within easy walking distance. She would be willing to let her rooms, either with or without board, as may be required. In the former case her charge would be 300 francs, in the latter 80 francs a month.

Feeling sure that you would be glad to give publicity to this, I have ventured to send it for insertion, in the hope that her case may meet the eyes of some who may have friends projecting a visit to France, and who would be glad to know of a comfortable residence in a French family. If so, please note address for future reference :—Madame Dubois, 7, Avenue Gambetta, Chatou.

Yours truly,

Geo. Cunningham.

April 7th, 1897.

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Original Communications.

PRACTICAL POINTS IN THE RELATIONSHIP OF MEDICINE TO DENTISTRY.*

By J. E. GEMMELL, M.B., Anæsthetist, Liverpool Dental Hospital.

MR. PRESIDENT AND GENTLEMEN,—When Mr. Woods asked me to read a paper before your society, I found myself wondering what I could write that would be of interest to you, and was led to the choice of the relationship of medicine to dentistry from the fact that a very large proportion of the medical profession are apt to consider the teeth as of little service in the animal economy except as grinders and aids to mastication, and as a part of the anatomy which even, with all their intricate nervous mechanism, are separate and apart in their relationship to the other systems of the body, and playing little part in the production of direct disease or reflex symptomatology, and that all the dental surgeon has to attend to is their extraction or conservation when giving rise to pain.

On the other hand, many dental surgeons are apt to think, on the same lines, that all affections of the teeth are primarily and wholly due to pathological changes in the teeth themselves, without being in any way affected by changes or disease in any other organs.

The subject of the relationship of medicine to dentistry is so extensive that it would be impossible to enter into it very fully in the time at our disposal, therefore I shall endeavour to deal with some practical considerations. (1) As to the direct effect of disease and constitution on the teeth. (2) The converse of this, viz., the effect on the economy of want of teeth and dental caries; and (3) the direct reflex effects from irritation of the fifth nerve and its connections.

I.—*The direct effect of disease and constitution on the teeth.*—Where an individual is in a sound and healthy state, there is an activity and cell proliferation going on throughout the whole body, which may be considered as a "*vitality*," or life producing process.

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* A Paper read before the Liverpool Odontological Society.

being carried on in all the various tissues, resulting in repair of the wear and tear of daily life, and the removal of waste products, and it is not reasonable to suppose that the teeth are exempt from this process ; but if the disease sets in, then some activity to normal repair must be suffered somewhere, during the process of extra work which has to be gone through by the animal economy in the repair of the damaged organ, and, that is to say, that during the repair some other tissue has to go short of its nourishment, or, at any rate, be subject to a lowering of vitality.

It is well known that during the progress of ill health, whatever may be the cause, the nails undergo deprivation in some way of their nutrition, and you will find ridges and inequalities in them corresponding to the period of ill health.

It is quite true that teeth, if broken or injured, never repair the damage done, as in the case of other tissues ; but we must remember that the vascular supply is not so active as in other tissues, and whilst it is doubted whether there are lymph channels or no, I cannot but think that there are (although not demonstrated) lymph canaliculi in the pulp cavity, and that they take a part in the normal nutrition of the tooth, which, if not preserved in some way, would possibly decay earlier.

In the same way there must be arrests of development taking place in the teeth, and it is on occasions when the vitality of the teeth is lowered that they are attacked.

There must be vitality in the teeth, or all teeth similary situated as to food, &c., would be equally attacked by decay, probably about the same time of life, yet caries usually commences, I understand, in fissures in the enamel, and these fissures appear to be arrests of development, and arise occasionally as a result of malnutrition.

I can refer markedly to the case of a young lady, aged 30, who had always had very good sound teeth, and had not known what it was to have toothache, and she stated that her family, as a whole, were blessed with good teeth ; she was laid up for some three months with typhoid fever, and during her convalescence, several teeth commenced to decay generally and rapidly.

Again, I have seen the same arrest of development as a starting point of decayed teeth manifested in nursing mothers, but not until their strength has been overtaxed, and the general health has begun to suffer from the malnutrition caused by an excessive drain, Another instance I recall in a man, aged 42, who had a severe and prolonged attack of rheumatic fever ; his teeth were intact and sound, yet caries set in during the convalescence.

In the same way prolonged mental worry is a starting point of caries.

These are only some few illustrations of the effect of lowered constitution or disease which have come under my own observation, and I must confess to being rather surprised to find that Sir John Tomes states " that caries is an effect of external causes in which so called vital forces play no part " ; and yet—what seems to me somewhat of a contradiction—he states that the patient's age influences caries, and that if caries has not set in before 25 the teeth will probably remain sound until the 50th year, when, coincidently with other manifestations of bodily decline, the teeth become liable to caries, that is to say, when vitality generally becomes lowered the teeth also partake in the change, as one would expect. Malnutrition in infancy has long been recognised as a cause of dental malformation and early caries ; and these teeth are often clear and pearly in aspect, their deviations from the healthy type being in structure and not always in form. Now, suppose an infant in its first year to be puny, ailing, and ill-nourished, this will, undoubtedly, result in early caries of the temporary teeth ; but if that infant is well tended and its health improved, it will develop into a healthy adult, and the permanent teeth be perfectly sound, thus partaking in the general improvement and nutrition.

Mr. Hutchinson considers that malformation of the permanent teeth, except in cases of hereditary tendency, are much oftener due to some transitory attack of inflammation of the alveolus during the first year of the child's life than to any interference with the nutrition of the whole body.

Constitutional diathesis has a marked affect on the teeth, and I need only refer to the peg-like teeth of inherited syphilis and the circular caries attacking the temporary teeth.

In the tubercular diathesis, the teeth are remarkable for their early whiteness, but in the strumous diathesis, which is so nearly allied to the tubercular, the teeth are usually of large size and good form.

The cause of the deformity in syphilitic teeth has been laid down as being not altogether constitutional, but also a result of inflammation in the gums, and in the same way the giving of mercurials in infancy and thrush are said to lead to alterations in the teeth ; in the former case, the teeth are thin, yellow colour, and thickly-coated with tartar ; and in the latter the teeth are often honeycombed, thin-edged, and serrate.

When patients such as those described under this heading therefore, seek your assistance, do not be content to look upon the decayed teeth as being only due to some external or accidental cause, but be alive to the general constitutional condition, and point out to them the desirability of setting themselves right as to the true cause of the trouble, and the prevention of its further attack on other sound teeth.

II. *The Effect on the Economy of Want of Teeth*, *and Dental Caries.*—The effect of want of teeth is so well known as to be universally recognised throughout the medical and dental profession ; but often not until very late in the day, although it is so obvious, medical men do not send their patients to the dentist soon enough. It is when the molars go that the trouble begins ; and as long as the incisors above and below remain intact, and as long as there is little or no alteration in appearance, people will foolishly go on without any attention to their loss, until the stomach suffers. For healthy digestion, the food must be thoroughly broken up and masticated, and hard gums and incisor teeth alone cannot do this work thoroughly. The patient practically goes on swallowing hard masses of food, and eventually all forms of dyspepsia come on, and ill-health and wasting is the result. Or, on the other hand, as is so often seen in young women, they know they cannot masticate properly, so put themselves on a diet of tea and bread and butter, a diet wholly inadequate to sustain them, and as a result anæmia, chlorosis, dyspepsia, gastritis, and ulcer of the stomach declare themselves. One could relate case upon case as typical of the train of events following the want of grinders, and the ill-health and misery resulting : one, however, is sufficient to emphasize the danger :—A young woman, aged 24, had suffered from toothache for some years, and only had some molar stumps in the gums, with complete absence of even stumps in some places : the incisors and canines were present in the upper jaw, and all in front and to the bicuspids in lower jaw. She had been without teeth three years, and for two years had lived on tea, bread, toast, soup, a little fish and potatoe ; prided herself on not eating meat. Anæmia came on, and with it the gastric symptoms became intense, therefore she put herself on tea alone, and matters went on getting worse, until she got a gastric ulcer, which opened into a vessel, and she died of hæmorrhage. In this case her doctor was not to blame, for she had been told, two years previously, that she must have the stumps extracted and a new set of teeth. More interesting, however, and most commonly missed by the medical practitioner, are cases of illness arising from the teeth, most frequently, dental caries.

Neuralgic Affections of the face, arising from the teeth, are so well understood, that the first thing a physician does is to ask the patient the question, "Have you any bad teeth?" and, getting a negative answer, he proceeds to treat the neuralgia; and if it yields readily, then he presumes it is not from the teeth. But there are numbers of cases which I am sure you in dental practice see daily of neuralgia, from a curved wisdom tooth, or decayed stump lying under the gum, which only the trained dental surgeon can diagnose; and I would like medical men to recognise this fact, and have a dentist's opinion on the mouth early, and save so much suffering.

Fistulous Openings in the lower jaw used to be a common sight as arising from a buried decayed root, but fortunately we do not so often meet with them now.

Abscess of the Palate.—I once saw in a young girl, aged 17, who was sent for an opinion on the swelling, about the size of a walnut, on the right side of the palate: there was no toothache, but she complained of a nasty taste in the mouth, the swelling and offensive breath. On pressing the lump, pus discharged around the teeth on the right side. I sent her to a dentist, the late Mr. Rose, who removed a decayed first permanent molar, and the swelling soon disappeared.

Another effect caused by irritation of a sharp carious tooth is an overgrowth of the adjacent connective tissue due to irritation, and this overgrowth is often mistaken for a malignant growth.

A former cook of mine, aged 41, reported to me one morning that she had been to her doctor, who said she had a cancer of the cheek; on examination of the mouth, I found a growth the size of a cob-nut, with an ulcerating surface, and, indeed, looking very like an epithelioma, but beside it, and constantly touching it, was the sharp-edged crown of an excavated decayed molar, which I thought a sufficient irritant to be causing the trouble. Mr. Bates removed that tooth, and in two weeks the growth had gone.

Such cases of tooth irritation causing lumps on the cheek, lips, and gums are common enough, but medical men are very apt to miss the real cause, and any case of doubtful growth in the mouth with decayed irregular teeth should never be touched until the dental surgeon has given his opinion.

Trismus, as a result of decayed teeth, one sees very often among hospital patients, but as a true lockjaw is comparatively rare these cases are generally known to be tooth mischief and sent off to the dental surgeon.

One of the most serious results of dental caries, and one which has not been frequently recognised is *pyœmia*. Tomes records cases of acute and chronic pyæmia of dental origin, all of which proved fatal, although I think one of the cases recorded, in which the patient died of suffocation, due to glossetis, set up by extension from an abscess of a lower wisdom, can hardly be classed as pyæmia ; nor another, in which an abscess of the lower jaw following an extraction, made its way up the ramus to the base of the brain and set up meningitis, which surely was the cause of death.

I have never seen any case of pyæmia from tooth abscess, but one can conceive that it is quite possible for such a condition to arise, and for the true cause to be easily overlooked.

I find a case recorded by a Dr. R. J. Poore, which is undoubtedly a case of pyæmia. The patient was a man, apparently healthy and strong, but had suffered for many years from neuralgia, and occasionally from crops of boils. He had frequent rigors and feverish attacks, profuse night sweats and retention of urine. A peculiar feature was the record of pain darting from the right side of the jaw to the bowels, bladder, limbs, hands or feet, and it was this starting point of the pain that led to close examination of the teeth, with the result that a little pus was found exuding from the wisdom tooth ; the tooth was extracted and a speedy recovery was reported. This case is another lesson pointing to the importance in obscure cases of investigating the mouth as a possible source of cause.

It has lately been pointed out that carious teeth may be a channel of infection in connection with tuberculosis, especially as associated with tubercular glands in the neck, and it is noteworthy, in connection with enlargement of cervical glands, how often it is found in the Dental Hospital that carious teeth have been the cause of enlargement.

In an article recently in the *American Journal of Medical Sciences*, by Strack, he states that out of 114 children with tubercular glands in the neck no usual causes could be found in 41 c/c, and attention was directed to the teeth. Enlarged glands corresponded in position to the carious teeth, and in many cases toothache preceded the enlargement. In two cases, especially, a youth age 18, and a girl 14 : enlargement of cervical glands followed toothache ; both patients were healthy previously, and no tubercular history. In the youth tubercle bacilli were found in the carious molar, and in the girl a suspicious looking granulation was found between the roots of the molars which on microscopical section showed tubercles with giant cells.

From this extract it is evident that we have yet much to learn respecting tubercle as associated with tooth disease, and it would be worthy of investigation by some of you who have the time to take up the study of teeth micro-organisms.

III. *The reflex and direct effects from irritation of the fifth Nerve and its connections.*—Hunting up medical and surgical journals one comes across most extraordinary instances of involvement of some part of the nervous system as a result of dental irritation ; nor is this to be wondered at when we consider the situation of the teeth, their free supply of nerves, and the swelling which their disease produces in the structures around. As to position, the posterior lower molars are close to the tonsils and eustachian tube, the parotid glands and external auditory canal ; the fangs of the upper back teeth are close to the orbit, and posteriorly they are close to the spheno-maxillary fossa and fissure, Thus, with a spread of inflammation from the periosteum of a diseased tooth, we can very easily understand the nervous complications that are likely to result. The nervous affections from irritation of the fifth nerve are classified as reflex and direct, the reflex being epilepsy, neuralgia, paralysis ; whilst the direct (including affections arising from contiguity) are local pain, facial paralysis, and some forms of blindness ; and, in cases of neuralgia of the head and neck, the irritation is probably a combination of reflex and direct.

The *reflex* effects of irritation of the fifth nerve are, most commonly, neuralgic pains of the head, and markedly so when the upper jaw is involved, and very commonly affecting the supra- and infra-orbital nerves, and often with them you find redness and heat in the skin of the area of distribution of these nerves ; and it is important to remember the connection of the fifth nerve through the gasserian ganglion with the sympathetic, and that its first or ophthalmic division divides into the lachrymal, frontal, and nasal. The most marked examples of reflex action are naturally to be found in the several branches of the fifth nerve itself, as a result of the irritation of one of them, but after them we find the branches of the cervical and brachial plexuses affected, giving rise to pains in the neck, shoulder, insertion of deltoid, acromion process and even the bend of the elbow, and with the pain some little loss of power—as witnessed by the inability to take a firm grasp—and complaints of fatigue.

As is the generally accepted fact, reflex nervous pain affects different individuals in very different ways, and those of a neurotic temperament are much more readily and extensively affected with a very small amount of irritation than are those of a phlegmatic or sanguine temperament. Added to pain we may find muscular spasm, paralysis, alterations in nutrition and affections of the special senses, all resulting from reflex irritation of the fifth, and the cause, though most frequently resulting from dental caries, may be brought about by any of the pathological conditions of the teeth and also by overcrowding of the teeth.

I can only recall one marked case of reflex nervous affection, but, in going through the literature of the subject, have found numerous cases recorded, and may, therefore, mention some of them. The case under my own observation was that of a child, aged 14 months, whom I was asked to see on account of its suffering from tetany. The child was well nourished and healthy-looking, but with this spasmodic contraction of hands and feet ; there was no sign of rickets, but, on looking into the mouth, I found an absence of teeth, with fulness and tenderness of the gums, and considered that the cause of the tetany. Other cases :—Cranial neuralgia from an impacted canine, neuralgia of the arm from carious teeth and undue pressure of artificial teeth ; where the patient suffered from neuralgic pain always referred to the left fore-arm, about two inches below the bend of the elbow, whenever any of the teeth in the left side of the lower jaw became irritable or tender from caries.

Wry-neck.—A girl suffered for six months, and had been under treatment constantly. Examination of mouth showed a stump and partially decayed tooth, which she declared were giving no inconvenience whatever; however, they were removed and she recovered in a few days.

Epilepsy.—In the *Medical Times and Gazette*, 1862, one finds a very marked case of *epilepsy* from carious tooth.—A boy, aged 13, has had frequent attacks of epilepsy for 18 months. Latterly his mother has noticed that some days he rubs his left cheek and complains of faceache, after which the fit follows. On examining the mouth, a decayed molar tooth was found, with a swollen gum around it, and partly growing over into the cavity: it was not tender to the touch, and the examination did not produce toothache. The sensation before a fit comes on is uneasiness rather than pain, and generally comes on between seven and eight p.m. The tooth was extracted, and for the next four months, during which he was under observation, there were no more fits.

Paralysis of Arm from an impacted carious wisdom tooth.—Patient, aged 24, was quite unable to use the left arm, to raise it, or to grasp with the hand; she could not hold her fork at meal times nor use the arm when dressing. There was constant pain. On examination of mouth, the left lower wisdom was seen, having come through the gum, but lying low down and horizontally placed, the crown pressing against the second molar; it was carious. The tooth was extracted and the pain and paralysis vanished.

Blindness from crowding of the teeth.—A boy, aged 11, complained that he wakened one morning to find he was blind. Previously, and on going to bed the night before, there was nothing wrong with his eyes. Examination.—The pupils were dilated, fixed, not influenced by light; could not tell light from darkness. The suddenness of the attack pointed to functional disturbance. Several causes were looked for, but examination of mouth showed crowding and wedging of the teeth together. Two permanent and four temporary molar teeth were extracted. The same night he could distinguish light from dark, and next day could make out objects, and, in a few days, sight "was restored." He had no other treatment.

Deafness.—Cattlin, in *Lectures on Physic*, edition 4, vol. 2, relates a case of reflex deafness from carious tooth. Lady had suffered for months, great pain in tooth, ear, and side of neck, and had been deaf for four days: inflamed tooth extracted, and hearing restored.

Alterations in nutrition, as might be expected where the nervous mechanism is so irritable and intricate, can be distinctly traced to diseased teeth, and Hilton, in his book on *Rest*, enumerates examples of perverted nutrition dependent on dental nervous irritation, propagated to remote parts by some collateral branch of the fifth nerve. Numerous examples of this are found. The hair on one temple becoming grey, the change coincident with, and dependent upon severe neuralgia, on that side of the head, due to carious teeth. Sloughing of the cheek caused by carious tooth. No sinus. Ulceration of neck, from carious wisdom. No sinus.

Direct affections of the nervous system from tooth disease are less common, and their mode of production more obvious. The portio dura of the seventh nerve, and the nerves entering the orbit, are most affected : and generally as a result of the spread of some inflammatory products, and enlargement of branches of nerves in them. As a result, cases of "*facial paralysis*" have been recorded.

Blindness, from abscess of antrum, following carious tooth, the inflammation extending from the tooth to the maxillary bone, the tongue, throat, and scalp, with injection and protrusion of the eyeball. Here the maxillary sinus was full of pus, and the axis of the eye altered, and vision lost : but was cured by the bursting of the abscess into the left nostril.

Another case, related in the *British Medical Journal*, is that of a man, aged 22, with ptosis of right upper eyelid, swelling of the face, with alveolar and antral abscess, from the right first upper molar : the sight of the eye was lost ; the tooth was extracted, the antrum pierced, and a large quantity of pus evacuated : ptosis, but not the blindness, was recovered from.

In these cases, the blindness was not due to damage to the eye itself, but rather to pressure, altered axis, and inflammatory changes, with anæmia of the optic nerve, also from pressure.

In the second case there must have been some inflammatory deposit in the sheath of the optic nerve itself, doing damage which was irreparable.

These cases are enough to demonstrate to us the importance of keen observation on the part of physicians when dealing with cases where paralyses of the fifth nerve and its connections are involved, or in any condition affecting the face.

In conclusion, gentlemen, I must thank you for the patient bearing you have given me, for much of what I have said, is quite common knowledge to you all ; the subject is one which might be treated at great length, and you will have many examples of teeth illness to relate, from your own practices, which have baffled physician and surgeon, and not been recognised by them, with a relation to their true cause.

In these days of specialism there is a marked tendency for the specialist, in whatever line he adopts, to look upon the symptoms of the patient presenting himself as being due to his own particular branch ; and in this way mistakes are often made. The more general knowledge a specialist has before he practices as such, the more likely he is to arrive at the true nature of a cause ; and it is equally incumbent upon the dental surgeon to be alive to the pathological conditions external to the teeth, which give rise to neuralgias and toothaches, as to have a knowledge of the pathological conditions of the teeth, giving rise to reflex and direct illness ; the balance, however, is in favour of the dental surgeon, where teeth illness is concerned, and the more widely the medical profession recognises the dental practitioner as a brother practitioner, practicing a special branch of medicine, the better will it be for the patients entrusting themselves to him.

WISDOM TEETH.*

By F. Manning.

Mr. President and Gentlemen,—Having been called upon to read a paper before this meeting, and being painfully conscious of my inability, I have been rather at a loss to find a subject in the treatment of which to display that inability to its best advantage. After much deliberation and many sleepless nights I have hit upon wisdom teeth as being a subject likely to be of interest to all of us and from a feeling of sympathy which I have always entertained for those too often unfortunate and short-lived members of the human dentition.

I have divided my subject into four headings, namely:—Development, Eruption, Irregularities and Extraction.

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* A Paper read before the Students' Society, Dental Hospital of London.

1. As to the development of the wisdom tooth, we know that it is in common with the other molars, that is to say, that its enamel organ does not originate from that of the temporary teeth, but that the tooth germ grows backwards behind the germ of the last temporary molar and dips more deeply into the substance of the tissues, and, to quote Mr. Tomes, "it then loses that continuity with the surface of epithelium which it had retained all round the rest of the jaw, and now presents itself as a free plate of epithelium only connected with that of the surface in front in the neigbourhood of the last temporary molar, the connecting bridge already beginning to be perforated: the germ of the first molar is developed from the tooth-band thus situated, and the band then goes on backwards and forms the germs for the second and third molars. The germ of third molar originates about the third year after birth.

2. The usual time for the eruption of the wisdom tooth is between the ages of 18 and 25, though it has been known to make its appearance as early as at 15 years, after the extraction of the second molar.

Its earlier eruption is also permitted after the extraction of the first molar, especially when this operation has been performed before the eruption of the second molar, the second molar having thus been able to move forward and make room for it. To go back as far as the year 1869, we find that at a meeting of the Odonto-Chirurgical Society, at Edinburgh, on October 2nd of that year, Dr. Thompson advocated the extraction of decayed six-year-old molars in order to allow room for the third molar to come into place, and it seems to me that in a crowded jaw this would be good treatment, though, on the other hand, it would be dissapointing if after this treatment had been carried out no wisdom teeth should make their appearance; but I presume he meant the operation to be deferred until there should be signs of their eruption, and, of course, one cannot suppose that he meant it to be peformed before the eruption of the second molar at any rate. The same gentleman also observed that "one could adduce hundreds of cases where both juveniles and adults have been brought to the gates of death from the irritation caused in the efforts of nature to force these organs through the hard bony edges, especially in the lower jaw." Well, 1869 is a long time ago, and happily, owing to our improved modern methods of dentistry, it is seldom that the gates of death are knocked at in consequence of dental trouble, but still it cannot be overlooked that the eruption of wisdom teeth in a crowded jaw is often a serious matter, and frequently gives rise to agonising pain, and severe complications.

Alveolar abscesses are frequently the result of the efforts made by a wisdom tooth to accomplish its eruption. A great many of the cases of earache which come under the notice of the general practitioner, or even of the specialist, are due to impacted wisdom teeth in the lower jaw. Absorption of the second molar is often caused by a wisdom tooth impinging against it, and in these instances, the absorption is not due to the pressure of the crown of the wisdom tooth against the enamel or cementum of the other, but to multi-nucleated cells which are developed at the point of contact, and which perform the function of osteoclasts in removing the obstructing tissues. In these cases it is often found necessary to remove the second molar as well as the third, and sometimes it is impossible to extract the one without the other.

One may quote numerous instances of the complications arising from the eruption or non-eruption of wisdom teeth, and among these I may mention the case of a wisdom tooth emerging just below the right condyle of the lower jaw in a patient of 65 who was wearing a vulcanite plate. The sub-maxillary and parotid glands were immensely enlarged and the trouble was attended by fever and delirium.

The case of a lower wisdom tooth with two fangs, one of which was deformed and its point inserted into the foramen, strangulating both the nerve and artery. It gave rise to severe, almost periodic attacks of tic. On extraction the fang presented a circle of exostosis about two lines from its point, showing the extent of its insertion and removing all doubts as to its having been the cause of the trouble.

In the Odontological Society's museum there is a model of a mouth showing a wisdom tooth erupting in the mid line of the palate. Appearing as it does at a somewhat advanced period in the life of the individual, at a time when the rest of the teeth have, so to speak, formed habits of mastication, it would almost seem as if the wisdom tooth were looked upon by them as an intruder, and resented accordingly; in the same way that we see a stranger entering a company of people who are all known to each other and who do their best to exclude him from their "set," especially if his qualifications are not such as to render him useful or ornamental, and, as it so often happens that the wisdom tooth is ill-developed and stunted, and often quite abortive, one can almost pardon the feeling of resentment entertained by the other teeth against so unwelcome an intruder, especially as his advent may cause crowding and consequent predisposition to caries.

On the other hand, the third molar is frequently a most useful addition to the dental series, particularly when it appears after the loss of a second molar, and provided it is sound and of a more or less normal size and shape, so as to be able to carry on the work previously accomplished by the lost member. The position of the wisdom tooth at the back of the mouth, and especially in the upper jaw, naturally renders it more or less difficult to insert a durable filling, particularly when the cavity is on the distal side, and many operators have so poor an opinion of the useful properties of this tooth that they extract it on the smallest provocation, and I think it is quite the exception to find wisdoms filled with gold, though there seems to me to be no reason why this tooth, provided it is of use, should not be treated with the same consideration as its fellows, and no doubt many are hastily sacrificed in order to save time, which, if treated with care, would possibly attain to a happy old age, full of the consciousness of having done their duty faithfully and well.

3. As regards irregularities of wisdom teeth, their name is legion ; but I fancy the most common form both in uppers and lowers is the cone-shaped, or one-rooted tooth, though one finds upper wisdoms with as many as four roots not infrequently, and three-rooted lowers are not uncommon. It is to be noticed that the fangs of lower wisdoms usually have a greater tendency to bend backwards towards the ramus of the jaw than the other two molars, and in uppers the general tendency seems to be to bend in an outward direction. For this observation I am indebted to Mr. Gabriel, who has been at some trouble to collect several hundred interesting specimens for our inspection. Whatever the causes may be (and I suppose the difficulties of eruption may be considered the chief one) there is no doubt that wisdom teeth are subject to more variation of shape and size than any other tooth.

In the average European jaw the third molar is usually found to be ill-formed and stunted, sometimes having the two or three roots common to the other molars, upper or lower, as the case may be, and sometimes being merely a cone with a single pulp canal. In the lowest races of man known there appears to be but little variation ; it is large, and usually normally placed. Among savages it would seem to be fairly constant and of normal proportions, though in some specimens of the skulls of negroes it is seen to be stunted, owing to want of room.

Esquimaux often have the wisdom teeth small and crowded out of place, while among the African races instances are to be found both of small wisdom teeth, and, on the other hand, of the presence of fourth-time molars.

To go one step lower than man (and not a very deep step in a great many instances), one finds the anthropoid apes possessing large wisdom teeth, with the exception of the chimpanzee, in which they are smaller than the other teeth. The gorilla is peculiar in having them larger than any other tooth of this series, and the male orang and chimpanzee are so eccentric in their dentition that they cut the third molar after the canines have made their appearance: these two are, I believe, the only instances of the wisdom tooth not being the last to erupt. The wisdom teeth of the Spider monkeys *(Abelus)* differ from their other molars in only having one root.

These and many other remarks to the same effect, are found in the "Dental Anatomy" of Mr. Charles Tomes.

4. The extraction of wisdom teeth is thus treated of in "The Natural History of the Human Teeth," by Joseph Fox, published in the year 1833.

"The extraction of the dentes sapientiæ of the under jaw is attended with more difficulties than that of any of the other teeth. The jaw bone begins to rise on the outer side of the dentes sapientiæ in order to form the coronoid process, and in some persons, the rise of the bone is nearly as high as the tooth." He does not say a great deal about the removal of upper dentes sapientiæ, but in this book there is a very beautiful picture of a wisdom tooth with a large, I might almost say enormous, piece of jaw bone extracted with it by an unskilful application of the key instrument. This is an accident which, I presume, is less liable to occur now that the somewhat barbarous instrument is almost obsolete ; but, unfortunately, the fracture of the tuberosity of the upper jaw is of not over rare occurrence even in these enlightened days. Touching the difficulties referred to in this aged work concerning the extraction of lower wisdoms I think one may safely say that at the present time they do not exist, and although these teeth may not be *easier* of extraction than others they are not as a rule more difficult.

There is one obstruction, however, which is frequently met with, and though of no serious importance, is one which is often the occasion of much loss of time to the young operator in gas cases. I refer the fact that the gum has a tendency to adhere very firmly to lower third molars. The alveolar processes terminate at this point, and the gums being continuous with fleshy folds of mucous membrane they cling very firmly to the tooth, and care should be taken to prevent laceration of the gum when extracting : otherwise there is not much difficulty in most cases, though, naturally, the presence of much bent fangs, exostosis and such complications sometimes leads to the fracture of the tooth and even of the forceps.

Mr. Coleman, in his *Dental Surgery*, quotes a case of paralysis of the inferior dental nerve following the extraction of a wisdom tooth, only accounted for as the result of shock. The same author also mentions a case of fracture of the tuberosity of the maxilla in the extraction of an upper wisdom tooth with forceps (not with an elevator) in the hands, as he says, of one who could only be characterised as a careful and successful operator. This is an accident which fortunately does not happen to all of us every day ; but, as the old saw tells us : the best regulated families are not exempt from untoward occurrences of a disastrous nature.

Many curious patterns of forceps have been invented by ingenious people for the extraction of wisdom teeth, but I think a pair of bayonet-shaped forceps for uppers and a straight elevator for lowers are the most popular instruments among dentists of the present day. It would be well for many among us if we could firmly impress on our minds the fact that the elevator is *not* the instrument best adapted for the extraction of upper wisdom teeth, though I believe its use has on more than one occasion been recommended to the examiners of the Royal College of Surgeons by candidates for the L.D.S. For the extraction of those in the lower jaw, however, the elevator is undoubtedly most useful ; it has been in use for many years and is recommended by Thomas Bell as far back as 1835, in his "Anatomy of the Teeth."

In conclusion, I must ask you, Mr. President and gentlemen, to exercise your most lenient criticism on my paper, and I can only hope that though I may not have interested you, I have, at any rate, not bored you ; at the same time thanking you for the attention which you have given me.

Reports of Societies.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The Ordinary Monthly Meeting was held on the 3rd ultimo, the PRESIDENT (Mr. R. H. Woodhouse) in the Chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen signed the obligation book, and were admitted members of the Society :—Mr. J. Lewin Payne, Mr. J. G. Wallis, Mr. J. J. Parfitt, and Mr. Henry Wood.

Messrs. W. R. Humby and G. W. Bateman were appointed Auditors of the Accounts.

Owing to the failure of the electric light, an exhibition of lantern slides, standing in the name of Mr. Tomes, was unavoidably postponed, and, in consequence, the evening was devoted entirely to the discussion of casual communications.

Mr. CLAYTON WOODHOUSE, on behalf of Mr. Peyton Leveson, of Hereford, showed models of the mouth of a girl, aged 14, which exhibited, on the right side a want of articulation, due to the retarded eruption of the first permanent molars and second bicuspids, somewhat similar to the appearance of the impacted condition often met with in the temporary teeth. Mr. Peyton Leveson asked for some information as to the possible cause of the deformity, and for suggestions as to treatment. He (Mr. Clayton Woodhouse) thought the best thing would be to keep the mouth under observation for a year, and afterwards extract the six-year-old molar.

Mr. J. H. BADCOCK thought that one way of treating the case would be by means of traction : the method was employed for front teeth, whether it had ever been tried in the case of back teeth he did not know, but he saw no reason why it should not be. It seemed to him that it would not be a difficult case to fix a metal wire or band in front and behind, and by means of elastic or springs, exercise traction on the teeth, and that might have the effect of making them erupt to their full distance.

Mr. J. F. Colyer, at the request of Mr. H. G. Read, from whom he had received them, exhibited models of open bite and inferior protrusion. The cases of open bite were interesting as showing bad forms of open bite, and from the somewhat novel method of treatment adopted by Mr. Read. One of the cases had some bearing upon the model which Mr. Clayton Woodhouse had just shown. The first case was one of marked protrusion of the lower jaw, accompanied simultaneously with defective development of the upper. Mr. Read, finding the two central incisors were very badly developed, cut them off, and made an upper plate covering the remaining teeth. It would be seen from the models that by this treatment Mr. Read had certainly given the patient a respectable masticating apparatus, and at the same time considerably improved his appearance. In October last year, Mr. Harry Rose reported, in the Association Journal, a case which was rather worse than that shown by the model in which he removed all the teeth. In the present case Mr. Read had practically kept all the lower teeth, and put a plate over the upper. Whether it would have been better to remove the upper teeth was a matter of opinion. Personally, he (Mr. Colyer) preferred Mr. Read's system. The next was a case of non-occlusion in the region of the bicuspids and molars, which was exactly similar to the case of Mr. Peyton Leveson's. The second bicuspid was standing, and also the second molar; Mr. Reed had capped these two teeth, and put on a kind of biting block, which brought the lower teeth up to the upper, and gave the patient a fair masticating surface. In the other case, instead of putting a kind of biting surface on, he simply crowned the upper and lower teeth, the two second bicuspids and also the two molars, and in that case he had given the patient a very excellent masticating surface. The last model was a case of very marked inferior protrusion, in which the whole of the upper teeth bit within the lower teeth, and in that case also, as would be seen by the models, Mr. Read had given the patient an excellent masticating surface. He (Mr. Colyer) thought that open bite was an atrocious form of deformity to have to deal with, and that any cases showing methods of treatment must be really useful to all members of the Society.

The President thought the way in which the difficulties were overcome was very ingenious. He always liked, in cases of treatment, to give the teeth a chance if possible of normally articulating. It was astonishing how well teeth would approach one another, even when they seemed to be hopelessly separated, if a sufficient interval of time were given them. The lower teeth rose and the upper teeth fell and articulation and mastication were really wonderfully helped. In the cases shown there was nothing for it but to adopt some artificial means to raise the bite.

Mr. J. F. COLYER also mentioned a case of what he termed pain resulting from galvanic action. About two years ago he filled a left second lower molar for a lady with amalgam. Occluding with this tooth there was a gold crown. The lady came back about two days afterwards complaining of distinct pain every time she ate anything, and made the assertion that the pain was, in her opinion, due to electric action. He cut out the whole of the surface of the amalgam filling where the gold crown occluded with it, and filled it up with a non-conducting filling, an osteo plastic, and from that time the pain vanished. He had had a similar case quite recently which he had not yet treated. The patient was wearing a biting-block, which occluded with an amalgam filling. The tooth was not painful to heat or cold ; but every time she brought the gold biting-block in contact with her amalgam filling she felt pain. Mr. Colyer mentioned another case, which he thought was interesting, because, to a certain extent, probably, he had failed, or it was a case showing how difficult it was to arrive always at a correct diagnosis. The patient had come to him in the beginning of the year suffering from slight pain in the upper jaw. On examining her mouth he found that she had a second upper bicuspid with an exposed nerve and an upper molar in the same condition ; the first bicuspid was also very carious. At that time there was absolutely no pain in the lower jaw. He killed the nerve in the second upper bicuspid, and in doing so caused her great pain and set up a very bad form of neuralgia, so much so that she was in bed for three or four days. Thinking that the neuralgia in all probability was due to the exposed nerve in the first upper molar, he killed it and treated and filled up the root canals. The neuralgia still continued, and after a period of about ten days, settled in the lower molar teeth in which the wasting of a Sullivan's Amalgam filling had been repaired without cutting out the original stopping. In time it became necessary for a dentist to remove the tooth, and when this was done immediate and complete relief from pain was obtained. The patient brought the lower molar to Mr. Colyer, and when he cut it open he found that he certainly had not done what he thought he had done in making the undercut, viz.: expose the nerve. There was quite a thick layer of Sullivan's amalgam between his filling and the pulp. The case was interesting as the whole of the pain originally located in the upper teeth. He mentioned the case because some two or three years previously his colleague, Mr. Ackery, had to deal with a left lower molar, in the posterior surface of which there was a Sullivan's amalgam filling in very much the condition just described. Mr. Ackery made a slight undercut on either side, and filled the tooth up with some form of Standard amalgam. He then went for his holiday. Two or three days afterwards the patient came, suffering from undoubted pulp irritation, and after a time it became necessary to remove the nerve. He (Mr. Colyer) had had a third case, where he had made good a wasted Sullivan's amalgam filling, and in all the three cases there had been pain. The nerve was certainly exposed in the process of making the undercuts. Whether it was a pure coincidence that the pain should have come on afterwards, or whether the fact of putting another form of amalgam on the top of Sullivan's amalgam set up irritation, he did not know.

The PRESIDENT said he was always very shy of putting amalgam of any other character on a Sullivan's amalgam ; he liked to remove all the old Sullivan's amalgam first rather than put a new amalgam on the top. He noticed the edges seemed to perish where they touched, but what action that was due to he would not pretend to say.

Mr. W. R. HUMBY asked Mr. Colyer what was the cause of the patient's first visit to him, if it had any relation to the three upper teeth, or was she suffering at the time of the visit ? He would also like to know whether he examined the dentine which intervened between the Sullivan's amalgam and the pulp substance for staining ? because, in one instance, where he (Mr. Humby) had a similar experience, the Sullivan's amalgam seemed to have imparted a stain to the dentine. In making a section of the tooth, there was a distinct area, confined apparently to the dentinal tubes, passing round towards the pulp, and that seemed to have been the only cause of trouble. He thought the reference to the upper jaw did not definitely prove that the pain originated there. Probably the pain originated in the affected pulp, and was due to the copper salts entering the dentinal structure. With regard to Mr. Colyer's experience with reference to the pain on contact between gold and amalgam, he had had several experiences of that, and in one case it was the result of a pin on an upper gold plate striking an amalgam filling in the lower jaw. The pin was shortened, and the pain subsided. In another case pain arose from a gold bridge resting against an amalgam filling. The amalgam filling had to be removed, and its place filled with gutta-percha, and then the pain subsided.

Mr. J. J. PARFITT said it occurred to him that if there was a current there must be some waste of the amalgam filling to drive that current ; might not the waste of some amalgam fillings be due to that cause ? He had particularly noticed in one case where he had a number of large gold fillings in front of a mouth and some Sullivan's amalgam in the six-year-old molars, the Sullivan's amalgam wasted very badly indeed ; and in a case not altogether dissimilar where Sullivan's amalgam was put in a similar position to the gold fillings, it lasted very well indeed.

Mr. BALDWIN said that with regard to Mr. Leveson's models, there were three methods of treatment possible. In the first place, the teeth which did not occlude might be crowned. The crown should be exceedingly long. With misplaced teeth of that sort one could never be certain that the roots were fully developed, in which case crowned teeth would not last well. The second method of treatment might be made with small biting blocks, not attached in any way to a bridge, but by means of bands to the teeth on each side. The blocks should be made of gold, struck up and filled with vulcanite, moulded on the tops of the teeth, and made to fit in the same way that a regulation plate fits on the tops of the back teeth when the bite is capped. The third treatment –if it might be called treatment—would be to let it alone. With regard to Mr. Colyer's case of pain due to galvanic action, he thought the members must all be familiar with similar instances. Some time ago he had a case in which the patient had been grinding away his teeth very seriously by biting, and he undertook to build the bite up all round. He did that partly by building up the teeth by cohesive gold and partly by filling up with amalgam, and he very soon discovered that it did not do in the least to have an upper tooth built up with gold and a lower with amalgam. When he tried it, the patient got a severe electric shock at once. In that case he had to cut away the tops of the amalgam which came into occlusion with the gold fillings, and put a shell of cohesive gold in them. Then there was no pain. Pain only arose when there was contact made or broken in those cases, and when the metals were simply in contact. In the same connection he might mention that in his own mouth he had had a cohesive filling in a live tooth without any cement or any other non-conductor under it, and, although it had been in for quite ten years, it was excessively sensitive if touched with the end of a fork. It gave quite a sharp shock of pain, which was evidently due to galvanic action.

Mr. F. J. BENNETT said it seemed to him that they had not got quite to the bottom of the question of galvanic action, because they had seen cases where gold fillings that had partly failed had amalgams added to them, so that the two metals must be closely in contact, and yet no shock had occurred. There was one condition that had not been mentioned, and which must always occur in order to produce an electric current, and that was an acidulated solution : he fancied the shock was only felt when acid saliva existed between the two metals. Another point was that these instances occurred almost invariably in the same patient—it was not at all a condition which they could prophesy would occur in *every* patient. The band of a gold plate touching an amalgam filling—say a platinum or other metal amalgam filling—would not always give a shock. It would be interesting, if anyone had a case, to apply a little litmus paper and see if there was an acidulated solution at all. He did not quite follow Mr. Baldwin when he spoke of the pain being only on making and breaking contact. A current due to metals in acid solution as a rule was a continuous and not an interrupted current.

Mr. BALDWIN said that he felt perfectly certain in his own mind that pain could only be caused by making or breaking contact, and that while the two metals were together there was absolutely no sensation, no matter how sensitive the tooth might be. That seemed to him to be fairly proved by the case he had related where, when an amalgam filling came into contact with cohesive gold filling and he built up the top of the filling with simply a flake of gold which was constantly in contact with the amalgam there was no shock or pain. It was his constant practice to use amalgam filling with gold or gold filling with amalgam without getting something of that kind, and it had also been his experience that when a gold band of a plate had touched an amalgam filling in a sensitive tooth, it very frequently caused pain when the contact was made or broken, but never while it rested quietly on the filling. Cases of absence of pain under those conditions seemed to him to be due entirely to the non-sensitiveness of the dentine. If there was a layer of the non-sensitive dentine underneath either of the fillings sensation would not be conducted, or would be conducted into a dead tooth.

Mr. W. HERN endorsed Mr. Baldwin's views, and mentioned similar cases in his own experience.

Mr. J. G. WALLIS mentioned a case where a large amalgam filling in the lower bicuspid came in contact with the gold band of a vulcanite denture. So long as the patient had the plate in the mouth he always had pain. It was not merely in removing or replacing it, but as long as he wore it.

Mr. C. SCHELLING said he saw a gentleman some time ago who was wearing a gold upper plate, and who had all his back molars filled up with great blocks of amalgam. He wore the plate with great comfort for many years, and there was no electrical action or trouble whatever.

Mr. SPOKES said, with regard to the question of the make and break of contact, he saw a lady from time to time in whose lower wisdom tooth there was an amalgam filling, and the second molar in front had a gold filling, but she never had any discomfort or trouble until it was touched by the rim of the mirror when he was giving a periodical overhauling of the mouth, and then she got a distinct shock at once.

Mr. BALDWIN suggested that the pain caused by the plate, as mentioned, was probably due to the patient's way of putting it in. Probably the patient always got pain when she masticated. Very likely the plate had rotted so that the band which was touching the filling was made to leave and touch again constantly. That would hurt very much indeed and cause a rapid succession of shocks, and the patient would be very apt to say that it always hurt her.

Mr. PEYTON BALY mentioned a case he had which corroborated Mr. Baldwin's view. He had an amalgam in a 12-year-old molar, and there was a gold plate on the lower with a hook coming over the lower to prevent it sinking. When the patient masticated she had pain which he traced to contact between two metals ; when the plate was at rest there was no pain whatever.

Mr. Colyer, in reply, said, with respect to the case of diagnosis, the patient was suffering pain distinctly in the upper jaw, and in the upper jaw he found the two exposed nerves, and yet eventually he had to cure her pain by the extraction of a first lower molar. With reference to the copper salt staining, mentioned by Mr. Humby, he would examine the tooth microscopically and see if he could find it. His recollection of it was that there was a very fair layer of perfectly normal dentine between the copper amalgam and the pulp. With regard to the case of pain from galvanic action, he simply brought it forward as an instance in practice. His own view was the view that Mr. Baldwin held, that it was on the make and break of contact that the pain was felt. They constantly saw amalgam and gold in the same tooth, and it was simply the make and the break of the current, accompanied by an acid saliva.

Mr. W. R. Humby exhibited and described a new angle mallet of his invention, and in doing so stated his conception of an ideal instrument was one which, while it conformed as near as practicable to the form of the hand instrument in size and outward appearance, should be capable of striking a sufficient blow in the required direction. The blow should be crisp and extremely rapid—it need not be very heavy—and the instrument should not be restless in the hand, as a strong grip would then be absolutely imperative in order to prevent the pounding of the edge of the cavity. Some years ago Dr. Bonwill, he believed, contrived an angle mallet, the power of a straight blow being used, and by means of incline planes the blow was diverted to a right angle. Recently the Dental Manufacturing Company had introduced an angle mallet invented by Mr. Moore, in which cycle balls were utilised to convey the power to the plugger, a reciprocating motion being used in making the blow, the latter being diverted to the necessary angle by the two devices mentioned. Still, to his mind, neither the one nor the other conformed to what he thought was convenient in use, the size of each being in excess. As the matter seemed to hinge on the manner in which the impulse was conveyed round the turn and the blow with its quality was already at hand in the straight palm mallet, it had occurred to him to employ the segment of a circle of steel having the turn, the segments sliding in a corresponding groove. The size of the instrument was thus considerably reduced, while the quality of the blow was not impaired. Having used this instrument for some months, he could state from practical experience that it made solid plugs, and from its small size had a greater range of positions during use than the larger instruments.

Mr. BALDWIN read the following notes on a case of an unerupted maxillary third molar causing inflammation in the substance of the cheek, simulating epithelioma:—In November last, an old patient of mine, an elderly man of ample build and proportions, came to me with a note from Mr. T. Smith, saying that the bearer had a lesion in the cheek, inside the mouth, which presented all the appearances of epithelioma, and asking me to look over the denture, which was a full upper suction plate, to see if it were free from all irregularities and so forth, which might cause irritation. On looking into the mouth, I found the centre of the cheek on the left side occupied by what looked precisely like an epithelioma. The cheek in the centre, over a space as big as a crown piece, was hard throughout. The external skin was bound down, immobile, and slightly reddened. The mucous membrane inside was hard, nodular and fissured; one large central fissure was raw looking, granular, and had everted edges, and the induration of the whole was very gristly, and characteristic of epithelioma. From this mass could be felt an ill-defined infiltration, extending upwards and connecting it with the maxillary bone. I found myself entirely in agreement with Mr. Smith, that the appearances were exactly those of epithelioma; yet I cherished a hope that the real condition was not such as the appearances indicated, on the following grounds: (1) That I had had the patient under observation about three months before, and had then noticed nothing unusual about the mouth, whereas now there was what looked like an epithelioma of many months' standing; (2) that the history of the lesion did not tally with that of epithelioma in that the first symptons had been severe pain and immense swelling of the side of the face, the onset of which had been only a fortnight before. (3) That there were no lymphatic glands to be felt in the submaxillary region. A local medical practitioner in the country had treated the swelling by twice opening into it with a lancet from the inside of the mouth in the centre of the cheek, but no pus had been found. The incisions accounted for the deep fissure in the centre of the mass as it existed when I first saw it, but not for the fact that the fissure was still unhealed, and presented raw and granular surfaces and edges which were indurated and averted. A fortnight later I received a letter from Mr. Smith, asking me to assist in examining into the whole matter with the patient under an anæsthetic. The patient was fully anæsthetised, and the examination commenced. The cheek was distinctly better; the part was more mobile, the track of induration extending upwards towards the maxilla was less easy to be felt, and the mass itself was somewhat smaller and softer. Mr. Smith drew my attention to what appeared to be a small stump, just showing as a tiny point at the extreme back of the maxillary alveolar process on the left side. On examining this with a pointed probe, the characteristic feeling of enamel was at once recognised, and a buried third molar was diagnosed. The conclusion was arrived at that this might be the cause of the whole trouble, and it was promptly extracted. The extraction was not very difficult, and was accomplished by first cutting away the gum over it by means of a scalpel, and then removing the tooth by means of curved upper molar forceps. The tooth proved to be a fairly-well developed third molar, with confluent roots, and presented nothing unusual except a small patch showing pericementitis on the root, near the apex. The extraction was not followed by any flow of pus. The subsequent history justified the more favourable diagnosis. No further treatment was considered necessary. In two days' time the improvement was very marked; the fissure in the centre of the mass had healed, the induration was much less, and the mobility of the external skin was fully re-established. Three months later I had the opportunity of examining the patient again, and then all appearances suggestive of epithelioma had vanished. The mucous membrane had returned to its normal flaccid condition. It was still somewhat corrugated, but it was also so, to a less extent, on the other side, and this is due to the amplitude of the tissues of the cheek, and is a normal condition in the case of this patient, who is, as I have indicated, full-bodied in all respects. The existence of the focus of inflammation in the centre of the cheek, while the cause lay high up in the maxilla, is to be explained, I think, by the deflection of the inflammation downwards and outwards from the root of the tooth by the attachment of the buccinator muscle to the maxilla. The root of the tooth was well above this attachment, and the products of inflammation seem to have travelled down into the cheek from the root of the tooth by the course I have indicated, and then to have occasioned acute inflammation in the centre of the cheek, resulting in the sinister appearances I have described. The case is of great interest as showing the completeness with which a simple inflammation sometimes may simulate epithelioma, and as exemplifying the advantage which a correct diagnosis may in such a case entail.

Mr. STORER BENNETT said that, unfortunately, it was not always the case that dental surgeons were called in to give the aid of their expert judgment. In many cases they might render very great assistance. The usual course of procedure in such a case would have been to have diagnosed it as one of epithelioma, and the patient's friends would have received the terrible news, and some severe operation would have been resorted to. The result would have been that when the operation was in progress, the error of diagnosis would be recognised ; but then matters to a great extent would be too late. He thought, therefore, that everybody connected with the case was to be congratulated on so successful a termination to it.

Mr. THOMSON and Mr. HUMBY also mentioned cases somewhat similar to that of Mr. Baldwin's.

The PRESIDENT having thanked the members who brought forward communications and the members who had discussed them, the Society adjourned to June 14th.

DENTAL STUDENTS' SOCIETY, DENTAL HOSPITAL OF LONDON.

A General Meeting of the above Society was held on Monday, May 10th, at 7.30 p.m. The PRESIDENT (Mr. C. F. Rilot) in the chair.

Minutes of the last meeting were read and approved.

The PRESIDENT then announced the award to Mr. J. C. Douglas of the prize for the best paper read during the past year before the Society, the subject being "Oral Antiseptics."

The Amended Rules of the Society were then brought forward for discussion and the amendments unanimously adopted.

On Casual Communications being called for—

Mr. BELSEY showed an oblique-rooted upper molar.

Mr. QUINTIN exhibited (1) dilacerated upper lateral from a girl aged 16 ; (2) also a supernumerary tooth that had been removed from the molar region of a man aged 21 ; (3) and a geminated temporary right upper central and lateral from a girl aged five years.

Mr. Pomarison related a case of a man, aged 75, who complained of severe neuralgic pain that originated in the region of the wisdom teeth ; all the premolars and molars were absent, and there was no history of pain after extraction ; there was no caries in the remaining front teeth.

The President thought the pain might be due to the inclusion of of nerves in the callus of the fractured alveolus ; he thought it would be interesting to see the effect of wearing artificial teeth.

Mr. Douglas related a somewhat similar case in an old man (edentulos) : the pain began behind the genial tubercles, and the patient had very indifferent health.

Mr. Walter related a case in which a right superior central bent forward almost at right angle to its apex, extracted from a patient aged 27. Upon the mouth being examined, a hard swelling was noticed high up on the gum above the position where the right central ought to have been. Upon probing, it was found to be a tooth substance ; the gum was then lanced, the tooth exposed and extracted. The patient had never had a right central, and could not remember ever having had a blow or accident likely to cause the tooth being diverted from its normal course.

The President then called on Mr. F. Manning for his paper on "Wisdom Teeth." (See page 251).

In the discussion which followed—

The President thought that Mr. Manning had scarcely laid sufficient stress on the dangers of erupting wisdom teeth ; he also thought the lower wisdom was less often a stunted tooth than the upper, in fact was generally a most useful tooth when allowed to come forward.

Mr. Morris asked if the infection of wisdom teeth might be due to obliquity of the tooth band.

Mr. Pomarison wondered if it was worth while treating wisdom teeth when dead as an ordinary tooth.

Mr. W. Woodhouse said that ordinary straight forceps, as used for upper centrals, were most useful for removing a wisdom when impacted horizontally against the second molar.

Mr. Morris thought Read's stump forceps most useful always for impacted wisdom teeth.

Mr. Gabell showed several points about wisdom teeth in a few he had selected from a collection of about 200 ; many upper wisdoms were very oblique, leaving the tuberosity somewhat unsupported. Other lower wisdoms exhibited a groove for the inferior dental artery ; he also advocated a free outward movement only for extracting upper wisdom teeth, and called attention to the frequency with which pain in the bicuspid region was caused by a mesial cavity in the wisdom tooth.

Mr. G. Smith asked the reason for such a high temperature in the case of impacted wisdom teeth.

Mr. Manning briefly replied.

The President having announced that the next meeting would be held on October 11th, when a paper would be read by Dr. Dudley Buxton on the "Humours and Amenities of Anæsthetics," the meeting was brought to a close at 9.15 p.m.

TO POLISH SCRATCHES FROM MOUTH MIRRORS.

Dr. M. J. E. Moore, of Allegheny, uses a medium sized felt wheel on the lathe and wet pumice. Use considerable pressure and plenty of pumice, being careful, however, not to generate heat by the too long application without fresh application of pumice. You will be astonished at the result. All scratches and marks made by corundnm stones, etc., on the mirrors, may thus be entirely obliterated.—*Ohio Dental Journal.*

FESTOONING THE GUMS WITHOUT CARVING.

After the teeth are set up and waxed in the usual manner, a thin tightly wound string is first run through the hot wax, then laid around the necks of the teeth, following the curve of the gums at the gingival festoons ; the string is smoothed and levelled down to the height of the wax plate, and the wax polished, with the string in position, using a soft brush and chalk. The case is now ready for investment.

After it has been vulcanized, the pink, rubber-festooned gums are polished with hard brush and pumice, then with soft brush and chalk, making a beautiful looking set, both in and out of the mouth.—Dr. Kessell, *Cosmos.*

THE DENTAL RECORD, LONDON: JUNE 1, 1897.

SINCE 1837.

THIS is a retrospective month. People are busy thinking of sixty years ago; they are also busy sitting on the top of these three score years and smiling a self-laudatory smile. The human tongue prates glibly of the "good old times," but the human mind is well content with that it has, or fancies it has, evolved; it ponders musingly on what the poor folks did then and is not unmoved by pity. Dentists also are fond of looking back, and though only an isolated few can remember the practice of dentistry in the year 1837, a fair number can trace back their recollections to within a few years of that date, and so tell us something of the condition of affairs then. What they do not tell us we fill in of our own imaginations, and the picture is apt to be a trifle doleful. First we commiserate the dentist of the period: a man whose education had to be almost entirely of his own making; whose opportunities of communion with his fellow practitioners were almost nil; whose instruments were few, and to our notions crude, and chiefly home made; who was but ill-supplied with the materials of his art by the then existing depots, having frequently to procure them wherever he could, and, certainly as far as teeth were concerned, from characters contact with whom must have been repugnant to many. We may, and should, congratulate ourselves on our improved advantages. Our range of work has much increased. We can do that which was impossible then and with greater ease. We have the engine, rubber dam, gutta percha and cement fillings, cohesive foils, vulcanite, mineral teeth, anæsthetics, a large choice of finely made instruments and many other things, not forgeting electricity. Surely we may be proud of our condition; but are we not just a little too apt to forget that to these very men, struggling with their many difficulties, we owe a great many of these very advantages ? Nay, more, pampered almost, as we are, but the very profusion of our facilities, are we not apt to miss some of that thoroughness and resource which was so eminently characteristic of the better men of that period. We may be able to do more because we have been shown the way, but our individual potentialities might suffer not a little by comparison with those early practitioners, trained in a harder school. Perhaps the chief, and even the only matter, we may legitimately congratulate ourselves on, is that we can be of service to a larger and wider section of the community. Dentistry now brings relief to people, who, in the old days, must have gone unaided. The benefit of the many aids to work is not confined to the dentist. The very ease with which he is enabled to perform an operation allows him to widen his field of practice, and to see patients whose lack of means would, in old days, have debarred them from dental aid. And we believe that the important advances that dentistry has made during these last six decades has not been an unimportant factor in the increasing longevity of the human race. We may not share in the triumphs of a Jenner, and eliminate a scourge sweeping off its hundreds, but we may individually claim to have been responsible for prolonging the life of many a patient, who, but for the aid given by the dentist, would surely have passed away at an earlier date. A better system of hygiene, a more certain treatment in disease, a more easy condition of life, have all contributed their quota, and a very large one ; but old folks are prone to believe that the improvements in dentistry during the past sixty years have helped more, even than these, towards their enjoyment, means of procuring proper nourishment, and, therefore, their length of days. Who will prove that they are wrong ?

It is with sincere regret that we hear of the death of Mrs. Howard Mummery ; we venture to offer our sincere sympathy to the distinguished President of the Representative Board of the British Dental Association.

News and Notes.

The *Dentists' Register* for 1897 shows a steady increase in the number of those upon the Register who hold diplomas. There were 1,456 in 1896, there are 1,549 in 1897. A comparison with the Dental Section of the Medical Directory shows, however, that there are a considerable number of those, who, having diplomas, might be registered, yet who apparently are not so. Those registered as being in practice before the Act have decreased from 3,452 to 3,287—thus the ladies names on the Register have decreased by 75.

We understand that Dr. Bonwill will be in town during the season, and will be happy to demonstrate to the Profession on those subjects in which he is interested.

We have received a report of the cases treated in the Dental Department of the North Surrey District School, Anerley, during 12 months ending May 2, 1897. It states that there were 705 Extractions, 632 being temporary teeth ; Amalgam Fillings, 25 ; Osteo Plastic, 31 ; Various, 10 ; Regulation Plates, 4 ; Removal of Salivary Calculus, 36 ; Miscellaneous, 81.

During the April examinations of the Royal College of Surgeons, Edinburgh, the following gentlemen passed the first professional examination for the License in Dental Surgery :—William James Newman Wood (Dumfries) ; Archibald McKendrick (Kirkcaldy) ; William Tweedie (Edinburgh) ; George Braidwood Wilson (Liverpool) ; Bernard John Taylor Bennette (Liverpool) ; John Park Inglis (Edinburgh) ; George Brewis (Gateshead) ; James Watt Somerville (Dumbartonshire) ; John Alexander Cairncross (Edinburgh) ; Frederick John Blight (Plymouth) ; James Macleod (Sutherland) ; George Albert Lloyd (Denbighshire) ; Alfred Marmion Beamish (South Africa) ; Charles Ernest Wilkinson (Birkenhead) ; Thomas Herbert Hillis (British Guinea) and Frank Ayde-Curran (Bombay). The following candidates passed the final examination and were admitted L.D.S. Edinburgh :—Ruby Grace Halliday (London) ; William Alexander Stewart (Perth) ; John Ainslie Duncan

(Cupar-Fife); James Irvine Wilson (Glasgow); Alexander Ballantyne Mackenzie (Inverness); Charles Edward Page, L.R.C.S.E. (Edinburgh); Robert William Markham (London); Edwin Robinson (South Shields); David Johnson Cameron (Kincardineshire); William Gardner (Edinburgh), and John Morison Hood (Edinburgh).

AT the April sittings of the Dental Board of the Faculty of Physicians and Surgeons of Glasgow, the following candidates passed the first dental examination:—Walter Bruce Hepburn (Glasgow); James Bowie (Glasgow); Alfred George Walby (Belfast). The following passed the final examination, and were admitted Licentiates in Dental Surgery:—Thomas Allday (Birmingham); Sydney Richard Excell (Glasgow); James Hepburn (Glasgow); Alexander Macgregor (Glasgow); Hugh John Miller (Glasgow); Thomas Taylor (Cathcart).

SEITZ narrates, in the *Zahärzthiche Rundschau*, a case of what he believes to be miliary tuberculosis of the mouth. The patient was 36 years of age, and had suffered tubercular disease of bones, both of the arm and leg, and there was no history of syphilis. When seen, three distinct areas of inflammation were present. Two were patches of caseating material with ragid margins, the third was less developed, and showed several spots of a grayish colour. The patient had difficulty both in masticating and in swallowing, but, according to the report of a physician, suffered from no other disease. During the course of five days four other imflammatory spots developed. The case was treated by applying the actual cautery to the tubercles and by using an antiseptic mouth wash. They rapidly healed.

CARL ZANDY (*Arch. f. klin. Chir.*, LII., No. 1, p. 178), states that he was able to collect 37 cases of Tuberculosis of the Alveolar Process from the literature of the last 25 years. He also gives the history of a patient observed at the clinic of Bonn. The teeth are of the greatest importance in the etiology of this condition. Carious teeth are the seat of entrance for tubercle bacilli. Wounds of the alveolar process, especially those caused by extraction, are of grave importance. Whether the bacilli come from a phthisical lung or from the outer world, they need no better soil for development than the alveolar cavity left after extraction. There is no seat of predilection in this disease, and any part of the alveolar process may be affected. As a rule, other parts of the buccal mucosa are involved at the same time. It is very likely that the pulmonary lesion which is found at the autopsy is secondary to the alveolar disease. Syphilis is no bar to a tubercular involvement of the alveolar process. The disease seems to develop between the ages of 15 and 50. Males are more frequently affected than females. Usually the gum will swell and become loose, soft, and bleed very rapidly. This will soon be followed by ulceration, with pale, sluggish granulations. Following this the teeth will get loose and fall out and the bone may become necrotic. Pain is not very marked, but salivation is very profuse and the mouth has a very foul odour. A differential diagnosis is to be made from syphilis and carcinoma. The diagnosis will be facilitated by the presence of tuberculosis of the larynx or lungs. The best therapeutic measure is through curetting and removal of all suspicious tissues. This can be followed by applications of equal parts of lactic acid and distilled water to all recurring foci.

THE following instances of the swallowing of artificial dentures are quoted in the *Deutche Monatsschrift f. Zahnheilkunde* :—1. A man, 20 years of age, swallowed, on February 29th, during sleep, a vulcanite plate, 4 cm. wide, 3 cm. deep, carrying four front and two back teeth. Violent dyspnœa followed. A sound passed easily the whole length of the œsophagus, but at the cardiac opening struck a foreign body. This manipulation pushed the denture deeper and it could not again be felt. On March 2nd it was passed per anum without pain. 2. On March 1st, during sleep, a woman, aged 29, swallowed a vulcanite plate, 4½ cm. wide and 2¾ cm. deep, carrying four front teeth. There was pain in larynx, and a foreign body could be felt behind this. Endeavours to remove it caused it to glide further down, it was, therefore, pushed into the stomach. On March 3rd it passed per anum. 3. A railway line keeper standing with his signal horn in the mouth received a blow on this horn from a friend which drove his denture backwards into the œsophagus. On attempting to remove it with coin catchers it slipped into the stomach. Forty hours later it passed per anum. It was a metal plate 4½ cm. by 1½ cm., with two teeth and four catches. 4. On October 7th, 1896, a workman, aged 24, swallowed his denture during drinking. He had violent retching. The sound touched a foreign body at a distance of 24 cm. from the teeth. But on subsequent attempts the sound passed into the stomach. A few days later the sound again detected a foreign body in the œsophagus, which by use of the œsophagoscope could be seen. Attempts to remove it failed. After performing œsophagotomy the plate was removed, but was so tightly held that it had to be broken to be removed. The denture carried four teeth and had pointed clasps. 5. A woman, aged 50, swallowed her teeth during the night of September 17th, 1896, but did not know this. Suddenly she was seized with difficulty in breathing and cyanosis, so that at first pulmonary œdema was diagnosed. The following day the respirations were less laboured, and the patient complained of pain in the neck and difficulty in swallowing, this increased the next day, when the son noticed casually that his mother was not wearing her denture, and so suggested to the medical man a digital examination of the throat and fauces. Subsequently he succeeded in removing the denture from the pharynx behind the larynx. It carried seven teeth.

Legal.

THE BRIGHTON CASE.

IMPORTANT DECISION.

At the Brighton Bench, on May 18th, "Moss Harris," of 99, Western Road, Brighton, was summoned for using the title of "dentist," contrary to the Dentists Act, 1878. The case had been adjourned from the 6th ult.—Mr. W. H. Blaber, solicitor (of the firm of Blaber and Watson, 12, Great Castle Street, Oxford Circus, W.), again appeared on behalf of the prosecution, and Mr. Bertram Jacobs defended.—Mr. Blaber pointed out that the case had been adjourned owing to there being a case in the High Court in which application was made by several gentlemen for a mandamus to compel the Medical Council to place their names on the Dentists'

Register. That case was heard on Friday week last, and the mandamus was then refused. He understood it was proposed to call further evidence for the defence, but he pointed out that the case was thoroughly gone into on the 19th January, when it was first before the Court, and that after hearing the evidence the Stipendiary said he was perfectly satisfied. He (Mr. Blaber) thought it would be somewhat unreasonable to re-open the case after this lapse of time, and on behalf of the prosecution strongly objected to any further evidence being given. Mr. Clydesdale, who appeared for Mr. Harris on that occasion, said he was unable to deny there had been a technical offence, and the only question was as to the amount of the penalty.—Mr. Jacobs said at the first hearing application was made for process against certain witnesses for perjury, but that was refused by the Bench, who thought the matter should remain over until the conclusion of the case in the High Court. That left them in this position, that the only way to nullify the evidence which had been given was to call rebutting evidence, and that was what he proposed to do. He added that an admission by counsel in a criminal offence had no validity whatever.—The Stipendiary: But supposing counsel pleads guilty on behalf of a client, and the client stands by and says nothing?—Mr. Jacobs: That is an extreme case; but even then I say an admission has no validity. He hardly liked to go behind the scenes in this matter, but he had only been instructed quite recently.—Mr. Clydesdale was instructed on the spur of the moment, and the case for the defendants had not been got up properly at all. At any rate defendant could hardly anticipate such evidence as was produced—evidence absolutely false. It was hardly possible for counsel in Court to hear from Mr. Harris, who was rather deaf, whether the evidence was true or not; and Mr. Clydesdale took it that such barefaced falsehoods were not likely to be told. The charge was not that of a dentist, he further said, but of holding himself out as a registered dentist.—The Stipendiary said he had no doubt the case was finally closed, but he would be very unwilling to shut out any evidence.—Mr. Blaber said the only reason for an adjournment was that the case in the High Court would probably influence the Bench as to the amount of the penalty.—The Stipendiary: Yes; but I think that carries with it the consequence of hearing further evidence. I will hear the evidence. —Mr. Blaber: Of course I am not prepared. I have not got my witnesses here.—Charles Gardner, engraver, of 20, Queen's Road, Brighton, was then called. He said he knew Mr. Harris's premises. He supplied a brass plate to Mr. Harris two years ago, and the word "dentist" was not on it. He saw the plate a week ago, and the word dentist was not on it then, and there was nothing to indicate that any alteration had been made. He had not observed the plate much between the time when he supplied it and last week.—John Marks, of 27, West Street, shop-fitter, said he had fixed a brass plate to Mr. Harris's shop front. He had not noticed the word dentist on the front, but he believed the words "American Dental Institution" were there.—John Oliver, 88, Church Road, builder, said he knew Mr. Harris's front. He wrote the blinds produced, in February, 1896.—Cross-examined : The words on the blind were precisely the same as when he wrote them. He swore that the word "dentist" was not on the blinds.—Harriet Elizabeth Smith, of 193, Ditching Rise, Brighton, said she was a patient of Mr. Harris's. The first time she went to Mr. Harris's establishment was on the 4th January last. She did not see either "dentist" or "dental" on the front of the house.—Cross-examined : She had not noticed the blinds at all.

Mr. Jacobs said he did not know whether the Bench were satisfied that the word "dentist" or "dental" was not used. He had several other witnesses he would call if they were not.—The Stipendiary said he thought it very probable that a mistake might have been made about the words.—Mrs. Mary Bowler, of 9, Powis Grove, said she had been a patient of Mr. Harris's for nearly five years. On the 4th January she was in the waiting room, and heard a conversation in the adjoining room between Mr. Harris, a lady whose name was given as Miss Watts, and a gentleman. The conversation was about some teeth, about a deposit, and also about a receipt.—Cross-examined : It was quite possible that a lot was said which she did not hear.

Frederick Boulger, of 19, Artillery Street, said he was a dental assistant to Mr. Harris, and worked in a room adjoining the operating room. The door was left partly open, and he always heard the conversation that took place there. It was his business to do so, so that in case of any such prosecution as the present he would be able to give evidence. He remembered a Miss Watts and a Mr. Wood, he believed, coming there on the 4th January, and heard them talking to Mr. Harris about some teeth, about a deposit, and about a receipt. He had been with Mr. Harris for two years, and during that time neither the word "dentist" or "dental" had been used on the front of the premises.—Cross-examined: He had no idea to whom the voices he heard, and to which reference had been made, belonged. As to the medal produced, he did not know whether it was a fact that anyone exhibiting teeth and renting certain stalls in the French exhibition to which it referred, got a medal.—For the defence, Mr. Jacobs stated that Mr. Harris was in practice some years previous to the passing of the Dentists Act of 1878. The main object of the Act was to provide that all practitioners should be duly qualified by reason of having passed through some dental hospital, and having received some diploma by some body qualified to award the same. Provision was, of course, made for those who were in practice at the time of the passing of the Act, that provision being to the effect that if they sent in their names by the 1st of August, 1879, they would be registered. It was quite impossible for all who were then in practice to give in their names by that time, and accordingly, by the 37th Section of the Act, discretion was given to the Medical Council to dispense with examination, and put on the register any whom they thought deserving. His client did not apply before the 1st of August, 1879, and consequently lost his right to be registered. However, he could have applied to the Council to be registered under their discretionary power, and it is admitted had he done so he would have been entitled to be put on the list.—Mr. Blaber: Why didn't he do so?

Mr. Jacobs: Eventually he did apply, and then the Medical Council said: "As far as we can see we should have put you on had you applied in time, but we must draw the line somewhere, we can't be putting people on for ever and ever," In 1892 the Medical Council passed a resolution by which they rescinded their former resolution and determined that, however deserving a man might be, they could make no exception by putting him on the list. Consequently his client, through a piece of folly on his part, remained to this day unregistered. There was nothing in the Act, however, to prevent a person practising dentistry, though unregistered, so long as he did not use words implying that he was a dental practitioner or a registered dentist. That applied to the theoretical portion of dentistry, and not to the mechanical portion—that of making teeth.

The Stipendiary: You think they can be separated?—Mr. Jacobs: I do not think a prosecution can be instituted against any person for making artificial teeth.—The Stipendiary: But if he makes them he must fix them and do all that a qualified dentist is required to do. The use of the word "dentist" by him is contested, but it is admitted that he called himself medalist and diplomist on the blind. Is not that a description implying that he was specially qualified to practise dentistry. Mr. Jacobs: No; I submit it shows he is specially qualified to manufacture artificial teeth, especially when you remember the rest of the wording as to the prices of teeth. I submit he was perfectly entitled to show that he was a skilled maker of artificial teeth. The very fact that it is necessary to use words suggesting that he was a qualified dentist is shown by the pains the prosecution have taken to get something very definite in the shape of an admission that he was a dentist or dental practitioner. In fact, the prosecution have given up their whole case practically as to the wording on the blinds and show cases.—The Stipendiary: I doubt whether they have gone so far as that.—Mr. Jacobs, continuing, said that all that had been shown was that when it was suggested Mr. Harris was a qualified dentist he did not deny the soft impeachment. The witness Baldry had said in his evidence at a previous hearing that when he went in he said to Mr. Harris "Are you Mr. Harris, the dentist?" Mr. Harris replied "Yes." Was that holding himself out as a dentist? He suggested however, that the witness was telling lies when he said the word dentist was on the show cases, and that he was paid to do it.—Mr. Blaber: No, no.

The Society in question, continued Mr. Jacobs, was a Society of theory-fed practitioners, who were jealous of Mr. Harris's success, and especially of his being able to advertise, which they were unable to do. They had got up the prosecution in order to gull the public by suggesting that because a dentist on the register he was necessarily more skilled than those who were not. He submitted that whatever evidence there was was prejudiced and perjured. It was not suggested in the summons that he implied he was specially qualified, but that he used the name of dentist, thereby implying that he was registered. It was shown he had not used the word dentist, and he submitted that disposed of the whole case. Mr. Blaber said witness had sworn that they said to Mr. Harris " Of course you are a dentist ? " and he replied " Yes." And further, " Of course you are a qualified dentist ? " and he again replied " Yes." Therefore he submitted that the summons was sufficient to cover the offence complained of.

The Stipendiary said there must be a conviction. The learned counsel for the defendant made out a very ingenious and proper defence, but he did not dispose of the impression on his (the Stipendiary's, mind, when the case was, as he thought, closed, that the defendant had acted in such a way as to constitute an offence in the meaning of the Act. There was no doubt defendant did take and use the title of " dentist," and in conjunction with a number of other titles which certainly implied that if he was not registered he was specially qualified to practise dentistry. He did not wish to express any opinion as to whether the word " dentist " was or was not in the shop window, but there was no doubt that other words—words amply and strongly calculated to cause anyone to think he did claim for himself the title of dentist and was specially qualified to practise dentistry—were used. Each witness had said he put this question to Mr. Harris—" Are you Mr. Harris, the dentist ? " and he replied " Yes," He (the Stipendiary) fully believed he did say it, for it was obvious that if a person practising dentistry were to say " No, I am not," the questioner would immediately walk out of the surgery. An attempt was made to separate the functions of dentistry, but he did not think it was possible to do so. There was no doubt that he had and was now practising dentistry ; the only question was whether he had made himself liable under this action. He (the Stipendiary) thought he had done so, and he saw no reason why he should distinguish between this case and those that were decided at the time when this first came on.

Mr. Jacobs said Mr. Harris was entitled, if he had applied in time, to be placed on the register, and the defendants in the other cases were not.

A fine of £5 and costs was inflicted, four guineas being allowed as solicitor's costs ; in default 21 days' imprisonment.

Abstracts and Selections.

CLINICAL CONSIDERATIONS ON INFECTIOUS GINGIVITES.

By Charles Greene Cumston, B.M.S., M.D.

Inflammation of the gums may have either an acute or chronic course, but no matter which this course may be, the affection will take on the three following stages, viz., stage of simple infection, stage of suppurative infection, stage of destructive infection.

Each of these stages can manifest itself independently from the others, according to the cause of the infection or the character of the soil in which it is evolved. Consequently, the single types corresponding to the three following affections are to be met with in practice, viz., simple gingivitis, purulent gingivitis, and, lastly, gangrenous gingivitis.

I will pass these three types rapidly in review. Simple gingevitis has also been described as erythematous or catarrhal. The beginning of the infection is occasionally marked by a general malaise, but usually of so slight a degree as not to be remarked by the patient. Anorexia may be pronounced, as well as a dryness of the buccal cavity, the latter symptom calling the patient's attention to his mouth.

The mucous membrane is hot, red, and rather painful. Soon there is a difficulty in moving the jaws, the breath has a disagreeable odour, and salivation is increased.

If the mouth is examined the gums will be found in a state of tumefaction and soft to the feel. A bright red line, having a width of two or three millimetres, situated on the free border of the gums, is easily seen, as it contrasts markedly with the dark-red colour of the remainder of the gums. Here and there a whitish film, covering the inflamed gums, will be observed, usually in the neighbourhood of the teeth. Sometimes the glands will become indurated and enlarged.

This form of gingivitis is generally very easily and quickly cured; however, it can transform into the suppurative form, which I will now take up.

The suppurative gingivitis is characterised by superficial ulcerations, and is ushered in quite often by fever. The patient does not feel himself; he is tired, has loss of appetite, and complains of his mouth as being dry and painful.

Then movement of the jaws becomes painful, and even impossible, due to the ulcerations on the gums and the indurated lymphatic glands.

The pain becomes dull and steady, and the patient, who can neither eat, sleep, nor speak, becomes prostrated.

The physicial signs are here more marked than in simple gingivitis. The transparent epithelium is raised up by a serous exudation, but which rapidly becomes purulent. The epidermis falls, leaving the swollen and thickened dermis bare. This surface bleeds easily, and is of a bright red colour, unless, as it sometimes happens, it is covered by a kind of dirty membrane, in which alimentary *debris*, mixed with the products of buccal excretion and secretions, especially tartar, are to be found.

It is under this more or less thick layer that the superficial ulcerations form, and which, although they quite often remain circumscribed, may extend not only all over the gums, but to the internal aspect of the cheeks and lips as well. There is consequently great salivation and fœtidity of the breath ; the submaxillary glands become tumefied and most painful.

In eight or ten days this suppurative form will get well, under proper treatment ; but if not it passes into the chronic state, or becomes gangrenous.

Gangrenous gingivitis may succeed the preceding forms, but more often it appears at the same time in patients recovering from some debilitating general malady. Patients feel sick, and complain of cephalagia, anorexia, and vertigo.

Hemorrhages from the gums make their appearance ; the great quantity of saliva is most troublesome to the patient, who finds that his gums are painful, swollen, and granular, while around the teeth notches will be felt. This is the first or fungous stage.

A whitish-gray deposit, a sort of pseudo-membrane, soon forms on the free borders of the gums, and underneath this are to be found ulcerations, which extend in size and depth, producing repeated hemorrhages and undermining the teeth, causing these to fall out. This is the stage of ulceration.

The infectious process continues its work. The mucous membrane, which was dark red, becomes earthy in look ; blackish patches of necrosis become detached, leaving the alveola bare. This ravage may continue in every direction to such an extent that death is the result.

The functional symptoms undergo the same increase ; anorexia and insomnia are complete ; the patient can neither eat nor speak, so great are his sufferings. Diarrhœa appears, the pulse is small and frequent, and a dyspnœa shortly precedes the comatose state, in which the patient dies.

A quick and proper treatment will be able to save patients with gangrenous gingivitis, but a cure is infrequent when once the symptoms of auto-intoxication have appeared.

There are intermediate forms of this affection, for example, vegetating fungous gingivitis and hypertropic gingivitis, but these are chronic types, and have little tendency to progression.

I now come to the study of infectious gingivitis, properly speaking, and shall purposely omit the toxic and trophic forms.

Scarlet Fever.—An inflammation of the gums may occur between the tenth and the fifteenth day of scarlet fever. This is an infrequent complication ; it may come on insiduously, but it may also be ushered in by severe general symptoms resembling a typhoid condition. The patient rapidly loses flesh, vomits continually, and an obstinate diarrhœa is present. The urine will be found to contain albumen. The pulse is small and rapid. Dyspnœa and delirium may supervene, and death is the result.

Scarlatinous gingivitis is quickly over in slight cases, and is characterised by tumefaction and redness of the mucous membrane, which readily bleeds.

The most frequent form in this disease is the ulcero-membranous gingivitis, which may become grangrenous. Pain is most acute, preventing movements of the jaw ; the saliva runs away from the mouth and the breath is very fœtid. Yellow pseudo-membranes appear on the free border of the gums, covering the ulcerations, which may extend in surface and depth, producing necrosis of parts of the mucous membrane. The infection may invade the lips and internal aspect of the cheeks ; the submaxillary glands are greatly enlarged.

The prognosis depends on the gravity of the lesions. Good when they are superficial, it becomes very bad when the infection becomes general. The alveo-dental ligament may be invaded and destroyed, and the infectious process may even attack the alveolæ. Excepting in the last-mentioned cases where the affection may be the source of secondary infections and of severe local lesions, demanding a considerable period for their cure, the gingivitis of measles disappears quickly.

Aphtha.—Chills, slight fever, headache, insomnia, and painful gums mark the commencement of aphthous gingivitis. The mucous membrane is red, bleeding, very painful, and tumefied. Soon the surface, especially around the implantation of the teeth, is covered by an eruption of confluent white vesicles, giving rise to superficial ulcerations. From the gums these vesicles invade the entire buccal mucous membrane. Sometimes the vesicles disappear, and there remain large patches of necrosed mucous membrane near the last molars, resembling ulcero-membranous stomatitis, while the borders of the gums are in a fungous and suppurating condition. In such cases the patient presents a typical typhoid condition, with gastro-intestinal symptoms, vomiting, and diarrhœa, while albuminuria, nervous symptoms, and adayamia are present. The gingivitis is most painful, and mastication is rendered still more difficult by enlarged glands, which may be considerable.

The aphthæ may be absolutely wanting; neither herpes nor ulcero-membranous stomatitis are present, and nothing but a pearly spider's-web membrane covers the gums (Pètre). All lesions disappear in from a few days to six weeks by antiseptic treatment.

Scorbutus is too well known for me to discuss it, and will only be mentioned here.

Gonorrhœal gingivitis appears any time during the evolution of specific urethritis; however, according to Ménard, it is towards the end of the malady, and nearly always following other infectious complications that it is present. Thus arthritis, orchitis, and orythema precede the buccal symptoms of gonorrhœa. Then a great heat is felt in the mouth, with a continual thirstiness; the gums, especially the lower, are red, livid, tumefied, and bleeding, while the mucous membrane swells up between the dental arches.

Mastication and speech become difficult and painful; fever is quite high, and salivation and fetid breath render the patient's condition most disagreeable.

As the disease progresses a pseudo-membranous exudation covers the border of the gums, hiding the more or less deep ulcerations. The ulcerations are sharply cut and of a violet colour. The internal aspect of the corresponding cheek presents at the same time, or successively, inflammatory lesions of the same nature. The lymphatics are enlarged.

Recovery from this gingivitis, which is not a contagion, but a *gonorrheal injection*, is complete in about two or three weeks. The treatment consists in cauterizations and antiseptic irrigations.

I now come to the pathological anatomy of the gingivitis, which is certainly too long to be discussed in full, but I will endeavour to give a concise description.

Redness of the gums indicates the commencement of inflammation ; it may be bright or dark ; there is tension and swelling of the mucous membrane. The epithelium falls, leaving the dermis bleeding and uncovered. The blood and lymphatic vessels are dilated, and a serous exudation quickly appears, soon becoming purulent. The pus-cells may appear at the surface of the mucous membrane before the epithelium has been cast off, and are sometimes seen between the tumefied cells, thus contributing to their necrosis and desquamation. The epithelium is not always washed away by the saliva, but accummulates in the smallest crevices, especially in the *culs de sac* formed by the tartar between the tooth and gum, and when lodged there contribute to the formation of ulcerations and fissures.

The mucous membrane often become fungous, and also—as for example, in scorbutus—may be covered with vascular granulations.

Usually it is covered by a pultaceous membrane, which conceals the ulcerations underneath.

The ulcerations vary in number, extent and depth ; they may remain for a long time superficial, as in tuberculosis, or rapidly invade the underlying tissues. They may be preceded by maculæ, papulæ, vesicles, or pustules, as in scarlet fever, measles, etc., while in other cases they are covered by pseudo-membranes, as in diphtheria.

The bacteria, which abound, act not only by their infectious and toxic properties, but by their agglomeration ; they may prevent circulation by mechanical action. The blood supply being thus cut off, the parts undergo necrosis, ulcerations form, and gangrene occurs.

The subdermic cellular tissue is generally in a state of œdema from the beginning of the gingivitis, while later in the progress of the affection it may be invaded by the infection and suppurate.

In some forms of the disease the secretions of the buccal cavity become very profuse, and even muco-purulent. This is due to an exaggeration of the activity of the glands of the mucous membrane, to which is added a sero-mucous exudation containing epithelial cells and leucocytes.

The consequences of a gingivitis are local and general. One of the most frequent local consequences is the generalization of the malady over the entire mucous membrane of the mouth. Diphtheritic gingivitis may be given as as a type.

Gingivitis may cause the loosening and falling out of the teeth due either to the propagation of the inflammation to the alveolo-dental ligament, resulting in its destruction, as in diabetes, etc., or, as is pointed out by Cruet, the alveolæ are first resorbed, and infection follows. If the infectious process continues we have an acute osteitis of the jaw, its progress being rather rapid, with periods of remission and exacerbation. Suppuration occurs, forming sequestra, fistulæ, etc.

As the mucous membrane of the buccal cavity is very rich in lymphatics, it is easily understood how the submaxillary glands become involved. The adenitis may disappear with the gingivitis, but it can take on an acute type, in which case the periglandular cellular tissue becomes involved in the process. This periglandular inflammation may undergo resolution or suppurate.

Diffused phlegmon is very infrequent, and occurs in debilitated subjects. The prognosis is very bad, as death may occur from septicæmia.

Gingivitis renders alimentation difficult or impossible, and may, in certain affections, such as tuberculosis, bring about death by cachexia. Salivation is also depressing, and does much to weaken the patient.

But the most serious consequence of gingivitis is *auto-intoxication.* This condition shows itself sometimes by gastro-intestinal troubles, vomiting and diarrhœa. It may become so serious as to affect a typhoid type. In other cases the nervous system appears to be especially acted on by the toxines. Godelier and Barth each report a case of gingivitis followed by adynamia and death.

The infection may attack some particular organ, producing serious lesions, as, for example, Brissaud's case, in which an infectious gingivitis was followed by endocarditis and broncho-pneumonia, with death to the patient.

The diagnosis of the infectious gingivitis will be passed over, as this paper is already too long, and I will close by making a few remarks on the prognosis and treatment.

The prognosis is generally a question of *soil.* No matter what the local factor of the inflammation of the mucous membrane may be, if the *soil* is neither infected nor intoxicated, nor debilitated in any way, the lesions will be slight and recovery rapid. On the contrary, if the local infection finds a soil profoundly impregnated by toxines or weakened by a diathesis, its progress will be rapid and produce most serious lesions, as I have pointed out. Consequently it is not on the advanced stage of the buccal lesions, but on the general condition of the patient, on which the prognosis should be based.

As to the treatment. This should be directed to two factors—viz., the general condition and the local lesions. I cannot here mention the treatment of each infectious disease producing a gingivitis, but will simply speak of the local care.

No matter what variety the gingivitis may be, it is a microbic manifestation, and in order to cure it the bacteria must be attacked; this is accomplished by severe antisepsis of the buccal cavity. First of all, the tartar should be removed, as it is a real culture medium, and a gargle of carbolic acid, one in two hundred; thymol, one in one hundred; or a more elegant and agreeable preparation may be chosen, such as Metcalf's spray solution, or listerine.

The permanganate of potassium I can highly recommend for buccal antisepsis, and I prescribe,—

℞. Kalii permanganat., 0.50; Aq. menth. pip., 40—M.
Sig—From eight to ten drops in a glass of tepid water as a mouth-wash.

The use of saccharin combined with salicylic acid has also a favourable action in these cases, the following formula being an excellent combination:

℞. Saccharin, Natrii bicarb. āā 1; Acid. salicylat., 4; Alcoholis, 150; Aq. menth. pip. 50.—M.
Sig.—Half a teaspoonful to a glass of tepid water as a mouth-wash.

For the fungosities cauterization by chromic acid crystals or nitrate of silver, applied on cotton tampons, should be practised. In some cases the galvano-cautery may be necessary. Chromic acid is, I think, perhaps the better, as its action is limited to the point touched, and the slough is eliminated in three or four days. The epithelium will have appeared in a week or so after.

When there is gangrene the foci should be destroyed by the galvano- or the thermo-cautery.

Such is the local treatment of the infectious gingivitis.—*International.*

Review.

THE AMERICAN TEXT-BOOK OF PROSTHETIC DENTISTRY. Edited by CHARLES J. ESSIG, M.D., D.D.S. Illustrated with 983 Engravings. Henry Kimpton, London.

THIS text-book, which is of high merit, is the work of several contributors, namely, Henry Burchard, Charles J. Essig, W. W. Evans, C. L. Goddard, Grant Molyneaux, Rodrigues Ottolengui, Ambler Tees, Jun., Alton Howard Thompson. The subjects are grouped in 21 chapters; the ground covered being wide, and including matters not usually dealt with in a book having the above title, *ex.gr.*, in the excellent chapter on metals, by the editor, the question of amalgams is touched upon. But it has evidently been Dr. Essig's aim to make this chapter as complete as possible, and we may congratulate him on presenting a really valuable and useful article. We might, perhaps, regret that he should have tried the impossible by attempting to give us a definition. When we read that "a metal may be defined as an elementary substance usually solid at ordinary temperatures, insoluble in water, fusible by heat and possessing a peculiar lustre," we recall the fact that many—for instance, the metals of the alkalies—are practically soluble in water, since they rapidly decompose in it, forming oxides, which are *very* soluble. Neither is fusibility by heat special to a metal, nor, perhaps, is mercury the only metal not solid at ordinary temperatures, for hydrogen surely should be a metal, since when solid it possesses the metallic lustre, which seems to be the only distinctive property of a metal as defined above which is not open to question. We do not quite understand whether Dr. Essig believes that dental alloy becomes black in the mouth like silver—because this is not so. Dental alloy tarnishes in the mouth, but so does gold, it is not covered by a film of black sulphide as is a silver plate. Probably this is due to the fact, which is not stated, that the alloy is, we believe, soaked in nitric acid after a preliminary rolling, whereby the silver is dissolved from the surface, leaving a layer of metal chiefly consisting of platinum. The chapter on Moulding and Carving of Porcelain Teeth, by the same writer, is again excellent, but it is a matter for sincere regret that, in a work which will be so largely read, the honour of first using porcelain teeth is not credited to the right person. Surely the fact that A. A. Planter first introduced their use in America is of comparative insignificance beside the benefit conferred on the human race by first making them. Seeing that there is evidence that porcelain teeth had been used nearly half a century before Planter appeared at Philadelphia, it would have been better to have told us of their first use. Space will not permit us to go through the various chapters seriatim, they are all good, and much that is really useful can be gleaned from their careful perusal. They include descriptions of Vulcanite, Celluloid, Continous Gum and Plate Work; the manufacture of Crown Bridges, Regulating Appliances, Obturators and Splints for broken jaws. In the last mentioned section the writer might have followed Kingsley in acknowledging the fact that a similar splint to that known as Kingsley's was in use at an earlier date, but unknown to Kingsley, by Howard Hayward; also, as the writer does not confine himself strictly to describing the manufacture of splints, it would have been well to have mentioned that, for many cases, ideal splint, Hammond's. The publishers have performed their part in a highly creditable manner, and we would venture to recommend this work as one well worthy of study by our readers.

THE DENTAL RECORD.

VOL. XVII. JULY 1ST, 1897. No. 7.

Original Communications.

THE MECHANICAL TRAINING OF PUPILS.

By THOMAS GADDES, M.D. Denver, L.D.S.Eng. & Edin.

THE training which the dental student receives during the required three years' mechanical pupilage is a question of the greatest importance to the profession. Of that there cannot be a diverse opinion entertained by any one worthy of being a dentist. In numerous instances the teaching capacity is equal to the requirements, and very creditable results are usually attained. Of that there is no doubt. But a large number—I even venture to assert that the majority—of registered dentists are not qualified to teach dental mechanics to pupils. Yet they do so ; and many of them do undertake so to teach with results that are disastrous alike to the pupils themselves, and to the profession at large. Those same students, whose mechanical apprenticeship has been a failure, in the course of time, probably, obtain an L.D.S., become registered as dentists, and in their turn receive pupils, undertaking to teach them dental mechanics for three years. In that way have degradation and incapacity acted and reacted upon each other until there has been brought about the existing condition of affairs, which is deplorable. "Deplorable" is a strong expression ; but who is he, knowing of the sad examples that come before our schools and the notice of others, that will not deplore the loss of three years' opportunity in the life of a young man ? And that loss is only one aspect of the case. When, after that period of pupilage, a student does not know how to arrange on a strip of wax a set of teeth in their respective order, who will say that the appellation is too strong ? Such an instance has occurred. Yet under proper training that student turned out a fair mechanic. Other examples of imperfect, rather, I would say, of no, training of pupils could be recorded, were it required to further degrade that which is deplorable.

This failure of the private apprenticeship system in the vast majority of instances has long been recognised. The question has frequently been discussed in our periodical literature, and by the British Dental Association and several of its branches. The schools, also, have attempted to counteract the mischief. With that object of improving the mechanical efficiency of the student and teacher of the future, the executive of the National Dental College instituted a practical course of demonstrations on dental mechanics. That was in '77—20 years ago. Two years later the Edinburgh school was founded, and followed a similar plan. Within the past decade the London School of Dental Surgery and also Guy's have established mechanical laboratories under the care of a special teacher, and other schools are following somewhat the same method. In that manner the dental schools have striven to meet the shortcoming, and considerable benefits have ensued. Referring to the Royal College of Surgeons of England, the Medical Council's inspector reports :—" With regard to the practical examination in Mechanical Dentistry, it may be worth while to note that having had a somewhat long experience (14 years) as an examiner, and having held that office when this was for the first time introduced into the examination, I have been able to note the effect upon the proficiency of the Candidates which has been induced. At the first two or three Examinations but few of the Candidates showed any proficiency at all. . . . . Now, on the other hand, it is on the average very well done, and but few fail to show real proficiency." My own firm opinion is that this improvement is due to the teaching of the schools, and not to the better training of pupils by their masters. These several movements are merely compensatory. The evil still exists. Effects only have been partially dealt with ; the cause remains practically unaffected.

At the beginning of this year there came into force the new regulation of the Royal College of Surgeons of England, which calls for attendance at a recognised school on " a course of Practical Dental Mechanics, including the manufacture and adjustment of six dentures and six crowns." The reports and recommendations of the General Medical Council's inspector to the dental examinations of the several licensing corporations, together with the Council's recommendation "that a course of Practical Dental Mechanics should be added to the curriculum," will also tend to improve the mechanical aspect of the scholastic tuition and of the qualifying examinations. Withal, those advances and recommendations are little more than beating round the bush, the centre of the deficiency has not been touched.

The pupil spends three years in receiving instruction in mechanical dentistry from a registered practitioner. It is there where the failure occurs; and it is to that, and to that alone, any reform to be efficient must be applied. The failure may arise from two causes: either the inability or neglect of the teacher, or the inaptitude of the pupil. The onus of that failure ought to fall upon the right person; and the task of endeavouring to overcome the *lapsus* should not be left to the dental colleges. Why should the dental colleges have to re-teach the student that which he has already passed three years in learning? It is unfair to the schools, and an incubus to the average student.

Let there be instituted an examination in Practical Dental Mechanics at the end of pupilage, to be conducted by the licensing corporations themselves—not by the schools—and that the passing of which shall be necessary before the student can enter upon the hospital part of his curriculum. If he does not pass, the failure reverts directly to the teacher, and between him and his pupil the responsibility rests. If the latter does not possess mechanical aptitude, he can the more readily turn his attention to other pursuits and save further loss of time and money in going on preparing for a calling for which he is unfitted. If it be shown that the master is at fault—that he undertook to do that which he failed to perform—a case at law might ensue; and as that aspect of his character became known, pupils in the future would become unknown to him. It is at this part of the road into the profession that a barrier is urgently needed. The preliminary examination weeds out many candidates; and an examination of this practical kind, at this time, would also eliminate a few who are unsuited for the profession. It would place a definite goal before the pupil, to attain which would be the approximate aim of his training.

During his three years' apprenticeship the pupil is taught Practical Dental Mechanics. Afterwards, in his dental hospital career, he could most appropriately be taught Applied (or Clinical) Dental Mechanics—the conduct of a given number of cases, from his taking impressions to the fitting in of the work and the final discharge of the patients. This, and the continuance of the existing course of lectures on dental mechanics, are matters of detail quite secondary to the point here advanced.

Four years ago a number of gentlemen began a most meritorious effort to place the teaching of dental mechanics on a proper basis. The underlying principles of the allied sciences were imparted. The proper use of the file, the chisel, the turning tool, the punch and the chaser; with order and system everywhere and in all things, and an expert teacher in each department—those were the lines of training adopted. What better training for the eye and manual dexterity could there be? Could any private work-room education excel it, even approach it in excellence? The teaching pursued in the laboratories of the dental schools does not approach this curriculum, neither in principles nor in manual training. Yet this Institute of Dental Technology has not met with that success which its virtues and the high purpose of its usefulness ought to have secured. Whatever its ultimate fate may be, the promoters have done this for the profession: they have shown on what general lines a science and art training in dental mechanics may be carried out. An institution whose first object is the good of the profession, not profit, so well equipped, and upon which much energy and finance have already been expended, and which has the good opinion of so many valued and respected members of the profession, ought not to be allowed to die nor have its opportunities finally blighted by any of the three London schools taking on at present the function of receiving mechanical pupils. Give it a chance. Give it support; and let it be well established before rivalry of that kind takes the place of gratitude due.

Finally. The evil exists. The worthy part of the profession recognises it. Reform has long been called for. The demand is still made. Urgency is not lessening. The action of some of the schools, the extension of the curriculum and of the examination of the Royal College of Surgeons of England, and of the examinations of certain other of the qualifying bodies; the reports of the visitor of the General Medical Council, and the specific recommendation of the General Medical Council to the qualifying bodies—neither one nor all of those advances and proposals strikes at the root of the evil. "That it is deemed desirable to have a preliminary examination in Mechanical Dentistry for students before they enter upon their surgical training" is a resolution unanimously agreed to at the Annual Meeting of the British Dental Association, held in March, 1894. Here is a remedy already accepted. This remedy may fairly be regarded as the voice of the profession ; it is in the hands of the profession, and delay in securing it accentuates the reproach. There is now nothing to wait for—why dilly-dally? The next step is to petition each of the four qualifying bodies: "That all candidates for the L.D.S., who begin their mechanical pupilage on or after January 1st, 1898, shall be required to pass an examination in Practical Dental Mechanics, conducted by the Royal College (or Faculty), before entering upon the hospital portion of the curriculum." Such a request going from the British Dental Association would receive every consideration by the respective authorities. The General Medical Council at the May Session decided to send to the Scotch and Irish Examining Bodies, for their consideration, certain proposed recommendations, including "That a course of Practical Dental Mechanics should be added to the curriculum." Whether this recommendation of the General Medical Council, on the resolution of the British Dental Association, will better correct the gross imperfection in the existing condition of pupilage, I most emphatically proclaim in favour of the resolution. And I also emphatically assert that the recommendation does not touch the cause of the deficiency. With all deference, I affirm that on this question the judgment of the profession is practical and to the point. The present, therefore, is the most opportune time for this suggested petition to be sent in. All the bodies would then have before them this view which the profession itself takes of the mechanical training and examination of students. In November next the Medical Council purposes amending the curriculum recommended by the Council, when suggestions from the examining bodies in relation thereto will also be considered.

Reports of Societies.

LIVERPOOL DISTRICT ODONTOLOGICAL SOCIETY.

THE Fifth Ordinary Meeting for this Session was held in the Medical Institution, Mount Pleasant, on Tuesday Evening, March 16th, at 7.30 o'clock.

Dr. WAITE (President) was in the Chair, and there was a fair attendance of members and visitors.

The HON. SECRETARY read the Minutes of the last meeting.

Mr. GASKELL showed a model of a lower: on the lingual side of the alveolus there were several small eminences which from his description were apparently bony.

Mr. WOODS handed around a very poor attempt at Bridge-work which he had removed from the mouth after only a year's wear. The tooth to which it was buttressed showed extensive caries. He also showed a model in which through early extraction of the right upper bicuspids, the six-year molar had taken up its position in close proximity to the canine, giving a very noticeable appearance to the patient.

Mr. PHILLIPS showed a specimen of geminated second and third right upper molars, which was clearly of physiological origin, and in appearance not unlike the case pictured in Tomes's "Dental Surgery." Also a second specimen of salivary calculus from the buccal surface of the left upper first molar, in size and shape about that of a small chestnut; the patient from whom it was taken was a woman about middle life, who came into the dental out-patients room at the Liverpool Royal Infirmary some years ago; when seen the woman looked ill and stated that what she thought was a tumour of the jaw had been growing slowly for a long time, and though painless in itself caused soreness of the cheek; the breath was most offensive, and on examination of the mouth the "tumour" was seen to be a concretion of tartar having an irregular surface like a cauliflower, the interstices being filled with a slimy paste formed of remnants of food and mucous; by pressure and friction the cheek had become ulcerated, and the appearance at first of the concretion and neighbouring parts was very suggestive of malignant disease: very slight pressure easily detached the mass, and nature in a short time restored the parts to a healthy condition. The chief point of interest in the case was resemblance to malignant disease both locally and in the general appearance of the patient.

The PRESIDENT then called upon Dr. Gemmell for his paper, entitled "Practical Points of Relationship between Medicine and Dentistry." See page 241 June DENTAL RECORD.

The paper provoked a very hearty discussion, in which Messrs. Phillips, Parsons, Bates, Capon, Gaskell, and Woods took part.

Dr. Gemmell was thanked for his paper and the meeting terminated.

THE DENTAL RECORD, LONDON: JULY 1, 1897.

"THE DOG IN THE MANGER."

THE consideration of the reports on the Qualifying Examinations in Dentistry by the Medical Council seems a slow business; but seeing that the adjournment of the discussion for six months is to enable the various recommendations to be referred to the different colleges for their opinion, this is probably a wise step. These recommendations are, as the "additional report" says, "by no means revolutionary." With minor modifications, the curriculum remains much as heretofore. A course of Practical Dental Mechanics is recommended, this to be in addition to the ordinary course of Mechanical Dentistry. We are afraid we hardly grasp what is implied by this course. Is it a course of practical work or of lectures on practical work? If the latter, wherein does it differ from the existing course; if the former, does it imply an opinion that something is missing in the three years' mechanical pupilage? The recommendation that the lectures on surgery and medicine should include pathology is good in theory, but in practice is likely to prove delusive. There are no special lectures on medicine and surgery for dental men, and the teachers of this subject already have their hands too full to be able to enlarge the scope of their lectures, indeed, one course of lectures never covers the whole ground, and the blot on this portion of the dental curriculum is that the lecturer may devote the whole of the particular course which the student happens to attend to a region of the body but remotely connected with dental surgery. In our opinion, a short course of lectures on general pathology would be of far greater value to a dental student than either, or, indeed, both the above mentioned lectures.

We are pleased to notice the suggestion that General Anatomy and Dental Anatomy should be separated from the final examination. But we cannot agree that it would be wise to include these subjects with the examination in Mechanical Dentistry, which, at latest, should certainly be taken during the earlier months of hospital work; but these might with great advantage be taken separately at the end of the first year. We have but recently discussed this question, and will simply affirm our opinion that the objections urged against this plan are of no weight. It would be a clear gain if the student were able to devote his last year at hospital solely to Dental and General Surgery. It is also suggested that Chemistry should be included in the first professional examination, although the student will have already been examined in this subject at the preliminary examination. Why this double dose of the same subject?

Although these recommendations were not discussed, a member of the Council, Mr. Thomson, raised an objection to the scope of the questions asked in General Surgery. It is possible that some members of the dental profession may be in sympathy with Mr. Thomson's aims, but we fancy a careful perusal of his remarks will make them include him amongst those friends from whom they would be preserved. Whether the questions be wide of the requirements or not, the arguments he adduced tend to raise the thought that it is somewhat remarkable, at the end of the nineteenth century, to find a man with such ideas with a seat on a body whose function is so largely educational. "We are about, apparently, to create a new order of practitioners—gentlemen who are to be dentists and to know a great deal of what the general surgeon knows — in fact, to make a class of dentists who, in some respects, are to be superior to the ordinary members or licentiates of the various surgical corporations. That," said he, "is the only observation I should like to make." So he raises this question not on educational grounds, not for the good of the dental student, but simply and solely on the ground of class jealousy, and in what position is he to estimate the use to which dentists put knowledge so acquired? Can we not gather it from his remark concerning the L.D.S. diploma? "This is a qualification for drawing teeth." A man with such a false conception of modern dentistry might, at least, be expected to hold his tongue, even if, by accident, he have a vote in the control of dental affairs. Unfortunately, the chairman of the Dental Committee seems to have taken his remarks quite seriously, and will call the attention of his own college to them. Let us hope this is but a polite way of smothering the debate, for though the whole question of the general side of the education of dental students might well be discussed, it should not be raised on a side issue. Surely it is morally wrong to force a student to attend and pay fees for lectures and practise at a hospital, and at the same time to tell him that the whole thing is a farce and that he must carefully avoid making any use of these opportunities to gather knowledge, because, forsooth, he might become superior to ordinary members of surgical corporations. Mr. Thomson, possibly, never read "Æsop's Fables" in his youth, probably he has forgotten them, certainly he could not have understood them.

News and Notes.

WE are pleased to note that Mr. Nathaniel Miller, L.D.S., has been appointed a Justice of the Peace of the borough of Preston.

Mr. JOSEPH A. WOOD, L.D.S.Eng., has been appointed Demonstrator in Operative Dental Surgery to the Liverpool Dental Hospital, *vice* L. J. Osborn, resigned.

AT a meeting of the Council of the Royal College of Surgeons of England, on June 10th, Mr. Charles Sissmore Tomes, F.R.S., was introduced, and the President handed him a cheque for £24 14s. 1d., the amount of the John Tomes Prize, with a document declaratory of the award. At the same meeting the Council added the Sheffield Royal Hospital to the hospitals the dental department of which are recognised for dental hospital practice.

MAJITOT has left a legacy to the Académie de Médicine of Paris equivalent to 500 francs per year. Every second year a prize, named after him, will be awarded for the best work on oral or dental surgery.

DR. CUNNINGHAM writes :—After considerable correspondence with Dr. W. G. A. Bonwill, of Philadelphia, I am authorised to state that he anticipates being in London during the first week in October, or thereabouts, and he will be glad to have the opportunity of giving various clinics and exhibits during his stay. The following is a brief programme of the work he is prepared to undertake :—(1) The many uses of guttapercha in Dental practice. (2) Clinic on Abbey's Soft Gold Foil (old fashioned). (3) His special methods of packing amalgam. (4) His special method of clasping teeth in small partial cases with a view of elevating bridge work. (5) Pointed fissure burrs and their uses. (6) Exhibit of new handpiece, toothbrush, &c. A detailed programme of the work will be found in the *Dental Review*, pages 274-277, April, 1897. A special demonstration course on matters pertaining to mechanical dentistry will be given at the Institute of Dental Technology. Dr. Bonwill will be happy to accept invitations from any dental college or dental society desirous of taking advantage of this opportunity. As he sails from New York on 3rd July, all communications had better be addressed to me, at 2, King's Parade, Cambridge.

THE Annual General Meeting of the British Dental Association will be held in the Medical School Buildings of Trinity College, Dublin, on Tuesday, Wednesday, and Thursday, August 17th, 18th, and 19th next. PROGRAMME SUMMARY—Monday Evening, August 16th : Reception and Conversazione by the President and Council of the Irish Branch in the Science and Art Museum. Tuesday, August 17th : Meeting of the Representative Board in the Board Room. The General Meeting, Addresses and Business in the Theatre. Reading and Discussion of Papers. [Arrangements for the evening's programme are in progress.] Wednesday Morning, August 18th : Benevolent Fund Meeting in the Theatre. Meeting of the Microscopical Section in the Theatre. (Lantern illustrations). Afternoon : Demonstrations in the Dental Hospital. [The Hospital immediately adjoins the Medical School of Trinity College. Electric current for motor and light is supplied].

Evening: Smoking Concert by the "Odontoblasts," at the Arts Club, St. Stephen's Green. Thursday, August 19th: Demonstrations, General and Microscopical, in the Dental Hospital. Papers, Discussions, and Casual Communications in the Theatre. Thursday Evening: The Annual Dinner. Friday, August 20th: Excursion, provided by the Irish Branch, to Glendalough, Co. Wicklow, one of the most picturesque spots in Ireland. Trinity College and grounds will be open to members, and luncheon will be served daily in the Great Hall, and arrangements for seeing various places of interest in Dublin will be made. Sir John Power kindly invites the Members to inspect his Distillery in John's Lane. The following hotels have been selected for recommendation to members, and are near to the place of meetings:—The Shelbourne, Morrison's Hibernian, Maple's, Jury's, Gresham, Métropole. The Royal Marine Hotel, at Kingston, Dublin Bay, will also accommodate members, and there is a frequent service of trains and trams between it and Dublin. Messrs. Gaze propose to issue to members a circular containing a list of tours in Wicklow and other parts near to Dublin, and of other holiday tours in Ireland.

THE Meeting of the British Medical Association in Montreal, following the meeting of the British Association in Toronto, may possibly attract some who would otherwise attend the Dublin Meeting. Our readers will doubtless have gathered full details of routes, fares, hotels, &c., from the pages of the *British Medical Journal*. The Medical Congress at Moscow is another rival attraction, especially as the journey to this may be combined with a visit to so many other places of interest, notably the northern capitals, Copenhagen, Stockholm, &c. A reduction in the ordinary fares is almost universal, and in Russia, membership of the Congress entitles the holder to a free pass over the Russian railways to Moscow. Notice of the route proposed to be followed must, however, be previously given. At Moscow, hotels, &c., promise a reduction of from 30 to 50 per cent. in their charges, and private hospitality will be liberally exercised. The *return* journey should be made *via* St. Petersburg, as a series of festivities have been arranged for the returning visitors. Forms of inscription as members of Congress can be obtained from Mr. G. H. Makins, 45, Charles Street, Berkeley Square, W.

CRICKET MATCH.

VICTORIA DENTAL HOSPITAL (Manchester)

v.

LIVERPOOL DENTAL HOSPITAL, at Liverpool.

VICTORIA DENTAL HOSPITAL.

P. E. Holdsworth, b. Wood	25
R. E. Lonie, c. Penrhyn, b. Quinn	3
P. S. Senior, c. sub, b. Quinn	0
H. A. Robertshaw (Capt.), c. Penrhyn, b. Bevington	10
J. W. Gibbons, b. Holt	9
A. Sherrat, b. Bevington	0
F. W. Horrocks, c. Bradburn, b. Bevington	2
H. Besford, b. Bevington	0
J. Stelfox, b. Wood	2
F. McKenzie, c. Bradburn, b. Wood	0
J. W. Sidebottom, not out	0
Extras	19
Total	71

LIVERPOOL DENTAL HOSPITAL.

E. Bevington (Capt.), c. Sidebottom, b. Robertshaw	8
G. B. Wilson, c. Sidebottom, b. Robertshaw	2
B. S. Wood, c. Sherrat, b. Holdsworth	7
C. Quinn, run out	4
R. Holt, run out	9
A. Penrhyn, b. Senior	17
T. Dennis, c. Sherrat, b. Robertshaw	0
F. A. Bradburn, b. Robertshaw	0
G. T. Blight, b. Besford	3
A. H. Bowkley, b. Senior	4
W. A. H. Saul, not out	2
Extras	12
Total	68

BOWLING ANALYSIS.

Victoria Hospital.

	o.	m.	r.	w.
F. J. Blight	6	1	9	0
H. C. Quinn	9	3	18	2
E. Bevington	7	1	16	4
R. Holt	6	2	7	1
B. S. Wood	3·4	2	2	3

Liverpool Dental Hospital.

	o.	m.	r.	w.
H. A. Robertshaw	10	3	19	4
P. E. Holdsworth	6	0	18	1
H. Besford	6	0	14	1
P. S. Senior	4·2	0	8	2

A TEASPOONFUL of tartaric acid in a basin of warm water is recommended for rinsing hands, napkins, instruments, &c., in for removing blood stains. They should be rinsed afterwards in plain water.

DURING the academic year 1895-6 124 Dentists qualified in the German Empire—as against 83 in the year 1894-5.

Law Reports.

SUPREME COURT OF JUDICATURE.

COURT OF APPEAL.

(Before the MASTER of the ROLLS, LORD JUSTICE A. L. SMITH, and LORD JUSTICE CHITTY).

THE QUEEN V. THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

THIS was an appeal from a decision of the Queen's Bench Division (Mr. Justice Hawkins and Mr. Justice Wright), reported in 13 *The Times* Law Reports, 386. The proceedings were taken by Mr. Isidore Spero for a *mandamus* against the General Council of Medical Education commanding them to place his name upon the Dentists' Register. The prosecutor was articled in April, 1875, to a duly qualified dentist, to whom he paid a premium of £30, and from whom he was to receive a complete dental education. The period of his articles expired in October, 1878. In July, 1878, the Dentists Act was passed. Section 6 of that Act, by subsection *c*, provides that every person shall be entitled to be registered under the Act who "is at the passing of this Act *bona fide* engaged in the practice of dentistry or dental surgery." Section 7 provides that a person shall not be registered under the Act under subsection *c* of section 6 unless he produces or transmits to the Registrar before August 1, 1879, information of his name and address and a declaration signed by him in the form provided in the schedule of the Act, or to the like effect. Section 37 provides that "any person who has been articled as a pupil and has paid a premium to a dental practitioner entitled to be registered under the Act in consideration of receiving from such practitioner a complete dental education shall, if his articles expire before January 1, 1880, be entitled to be registered under the Act as though he had been in *bona fide* practice before the passing of the Act. The prosecutor claimed for the first time to be registered in 1888, and the council refused his application on the ground that he had failed to make the declaration required by section 7 within the time mentioned—that is to say, before August 1, 1879. The question was whether the requirement of section 7 applied to persons who claimed to be registered under section 37. The Divisional Court held that it did so apply, and refused to grant a *mandamus*. The prosecutor appealed.

Mr. T. W. Chitty (Mr. Bigham, Q. C., with him) appeared for the prosecutor; Mr. Muir Mackenzie for the defendants.

The COURT dismissed the appeal.

The MASTER of the ROLLS said that they had to construe the Act as it was written. The prosecutor had clearly brought himself within section 37 of the Dentists Act, and it followed that he was entitled to be registered under the Act as that section provided—that was to say, he was entitled to be registered as though he had been in *bona fide* practice before the passing of the Act. What, then, would have been his position if he had been in *bona fide* practice before the passing of the Act? He would, no doubt, by virtue of section 6, subsection *c*, have been entitled to be registered under the Act. But that led them to section 7, which said that a person who came within the terms of section 6, subsection *c*, should not be registered unless he produced to the Registrar a declaration signed by him before August 1, 1879. The prosecutor in this case had not produced any declaration, and therefore he could not be registered. The judgment of the Divisional Court was right, and the appeal must be dismissed.

The LORDS JUSTICES delivered judgment to the same effect.

QUEEN'S BENCH DIVISION.

(Before Mr. JUSTICE HAWKINS and a Special Jury.)

LADY AND DENTIST.

ORME v. Messrs. ESKELLS (Limited) was an action in which the plaintiff claimed damages, in respect of what she had suffered in consequence of an operation in dentistry having been improperly performed upon her. The defendants denied all the allegations in the plaintiff's statement of claim, and they counterclaimed £2 7s. as a balance due in respect of their professional services.

The plaintiff conducted her case in person, and Mr. Colam was for the defendants.

The case of the plaintiff, Miss Ida Orme, an American, who is a public singer and songwriter, was that in October, 1895, she went to the defendants, in the Strand, in reference to three of her front teeth. These teeth were cut off and enamel ones upon platinum pivots were placed upon the stumps of the natural teeth, and they were fixed with the assistance of a gold plate. Some six months after one of the teeth was found to be out of position. The plaintiff consequently went again to the defendants to have it looked after. Her case was that the stump of the tooth was so dealt with that it was broken up, and thus the plaintiff was deprived of a front tooth, which it was said was a very serious thing to a public singer. She also complained that she had, in consequence of what had happened, suffered very great pain and mental suffering, and had also been hindered in carrying on her professional business. In cross-examination she said that some months after the first operation she wrote "Teeth are all lovely, thanks to the boy dentist." (Laughter.) The "boy dentist" was Mr. Joseph, who was an articled pupil of the defendants.

Several witnesses were examined for the defence to show that there had been no want of skill or care in performing the operations.

The jury, without leaving the box, gave a verdict for the defendants.

Mr. COLAM, in answer to his Lordship, said that the defendants would not press for costs.

Mr. JUSTICE HAWKINS: Then there will be judgment for the defendants, but by consent, without costs.

Mr. COLAM remarked that the lady's tooth was in the possession of the defendants; he did not know whether she wished to have it, because they did not want another action about that.

The plaintiff said that she did not wish to have it.

DENTIST AND DIRECTOR.

AT a sitting of the London Bankruptcy Court, before Mr. Registrar Hope, Louis Henry Goodman, surgeon-dentist, lately trading at Ludgate Hill and at branches at Manchester, Liverpool, Southport, Sheffield, Birmingham, and other places, applied to pass his public examination upon accounts showing total liabilities £61,548, of which £15,906, is expected to rank, against assets £58,821. Examined by Mr. H. Brougham (Official Receiver), the debtor said he commenced business as a surgeon-dentist in 1881 at Southport. He built up a very successful business, and opened branches in a number of provincial towns. In 1886 he came to London and opened at 41, Ludgate Hill. His system was to devote personal attention to every branch that was opened, and, later, to appoint a qualified operator to manage it. In 1888 he removed from 41, Ludgate Hill, because the Corporation, wanting the premises, bought him out, and gave him £4,000 as compensation. He then took in a second cousin as a partner, and they continued the business until May, 1896, when it was converted into a limited liability company, entitled Goodmans, Limited, with a capital of £100,000. Witness received his portion of the purchase money entirely in shares, and was appointed as managing director for life. He agreed to act without remuneration for the first 10 years, but the appointment ceased in consequence of the bankruptcy proceedings. He did not take any part in the management of Goodmans, Limited, because he got knocking about the City among the sharks—(laughter)—by which he meant that he had assisted in the promotion of companies and had speculated on the Stock Exchange. In February, 1896, he became interested in the promotion of the West Australian Trading Syndicate, of which he was managing director and principal shareholder. He found the money required for the purposes of the Syndicate. The Official Receiver: Did not your co-promoters find any of the money? Witness: No; they found me. (Laughter.) He attributed his failure to treachery, and to losses on Stock Exchange speculations in connection with the Trading Syndicate and Company. The Official Receiver cross-examined at some length regarding the witness's transactions with the West Australian Trading Company and Syndicate. The debtor said he had lost the whole of his property—or rather it had all been lodged as security—in connection with these transactions. He was called upon by the company's brokers to support the market by purchasing its shares, and the transactions resulted in a loss to him of £80,000; in fact, on one settling day alone he was called upon to pay over £25,000.

He had paid £37,500 as commission for obtaining loans, and had given security to the value of £199,000 to a creditor who had advanced £31,000. In one instance he had agreed to pay interest at the rate of 8,000,000 per cent. The examination was concluded.

DENTISTRY PROSECUTION.

In the Justiciary Appeal Court in Edinburgh, judgment has been given in an appeal by Alex. Emslie, carrying on business at Edinburgh, who appealed against conviction in the Edinburgh Sheriff Summary Court on a charge of contravening the Dentists Act, 1878. The charge was that, not being a legally qualified practitioner, he displayed a signboard and brass plate on the outside of his premises in Rankeillor Street with the words "American Dentistry"; that he affixed a brass plate to the door of his premises with the words "Dental Office" upon it. The prosecution was at the instance of the Hon. Secretary of the British Dental Association. The Sheriff imposed a fine of three guineas, with two guineas of expenses, and granted a warrant to poind and sell the goods and effects of the accused in payment of the fine and expenses. Five objections were stated to the conviction.

Lord Justice Clerk said that the Act struck only at a person holding forth himself as being specially qualified to practise dentistry; it was not at the practising of dentistry. It affected them only to the extent of depriving them of the right to sue for remuneration. He could not find in the words displayed by the accused that he claimed to be possessed of any special qualification. If the accused could, without coming into conflict with the criminal law, abstract or put in teeth, he could see nothing in the statute forbiding him doing so. Those words were just an announcement that the accused practised dentistry, and that was not struck at by the Act.

The Court sustained the appeal, quashed the conviction, and allowed the appellant 10 guineas of expenses.

DENTAL BUSINESS BEFORE THE GENERAL MEDICAL COUNCIL.

At the meeting of the General Medical Council, on Wednesday, May 26th, Mr. Bryant, as Chairman of the Committee on Dental Education and Examination, submitted several reports relating to the qualifying examinations of the four dental licensing bodies of the United Kingdom. He said that at the termination of the business of last November Session a separate report on the inspection of each of the four bodies had been presented to the Council, but only two of them—those relating to the Scotch bodies—had been entered on the minutes and discussed, the two other sectional reports and the committee's report upon these reports being postponed. So his duty now was to bring up the reports relating to the Royal College of Surgeons of England and the Royal College of Surgeons of Ireland and the committee's final reports. He had to present the report on the English college first, and although there was a great deal in it that was interesting, he would not read the whole of it. He, however, would read the remarks made by the visitor and inspector (Mr. Charles S. Tomes) and also the special report by the Dental Committee on the visitation and inspection. These were as follows:—

Remarks by Inspector.

"The general conduct of the examination, the scope and suitability of the questions asked, and the methods of marking adopted, leave little to be desired, and I have hardly any suggestion to make for their amendment.

"With regard to the question of marking, it might, perhaps, be better to emphasise more strongly the opinion of the examiners where candidates do very badly, and to make more use of the power to reject a candidate upon any one portion of his examination in which he is very deficient, which at present seems to be but rarely done.

"But, on the other hand, it is very unusual for a candidate to do very badly in one section of the examination and yet to do sufficiently well elsewhere to make up his deficiency of marks, so that I did not observe a single instance of a candidate passing whom I personally should have been tempted so reject on any one part of his examination.

"Thus against one I had noted in his oral examination in general surgery: 'Very poor all round; ought to be rejected.' He was given the minimum, but failed upon his total marks.

"It would, indeed, have hardly been worth while to say anything upon this subject were it not that the marks given for practical dental work being, quite rightly, higher than those for any other part of the examination it may be possible for a candidate who has done exceedingly well in this section to pass, notwithstanding his showing gross ignorance in some other section of his work.

"Conversely it has been known to happen, though but very rarely, that a candidate, who should certainly have been rejected upon his practical examination, has made up his deficiency of marks by quite exceptional excellence in his theoretical work.

"I learn, however, that this change is already in contemplation, and that proposals for its being done are now under the consideration of the Council, so it will suffice to express the hope that it may be carried out.

"A regulation requiring a period of extra study from rejected candidates before they can again present themselves has recently been adopted.

"With regard to the practical examination in mechanical dentistry, it may be worth while to note that having had a somewhat long experience (14 years as an examiner, and having held that office when this was for the first time introduced into the examination, I have been able to note the effect upon the proficiency of the candidates which has been induced. At the first two or three examinations but few of the candidates showed any proficiency at all, and a rigorous standard of marking would have resulted in the rejection of a very large proportion.

"Now, on the other hand, it is on the average very well done, and but few fail to show real proficiency.

"There appears thus to be tangible evidence that the average candidate prepares himself with a strict regard to the requirements of the examination and no more, and that, within reasonable limits, increased requirements do not lead to wholesale rejections, but are very speedily followed by an improved standard of capacity in the candidates.

"In conclusion, it only remains to add that the examination is not only sufficient, but leaves little to be desired."

REPORT BY THE DENTAL COMMITTEE.

"The Inspector points out that before the Dentists Act was passed in 1878, the Royal College of Surgeons of England granted a License in Dental Surgery so early as 1860, and that prior to that date no special qualification in dental surgery had ever been granted by any licensing body in Great Britain. He reports also that since 1860, 1,094 diplomas have been conferred; and that at the present time 712 licentiates of the English college appear upon the *Dentists' Register*, this number constituting half of the dentists registered as possessing a special dental qualification, and 14·4 per cent. of the total number of dentists admitted to the *Register;* the remaining 76·2 per cent. of registered dentists representing those admitted on the ground of their having been in practice prior to the passing of the Act of 1878. He likewise notes that of the 712 dentists registered as holding a license of the English college, 94, or 13·2 per cent., possess full medical or surgical qualifications. He states that for the last five years the average number of dental candidates has been over 100 per annum, and of these about one-third have been referred.

"Every candidate is examined under a number, and every part of the examination is conducted in the presence of two examiners. No examiner has any cognisance of the marks given by other examiners at another table. The marks obtained at each table are handed in to the Secretary, who enters them in a book, and the candidate stands or falls absolutely upon the addition of his marks—33 being the minimum required out of a maximum of 55. Every rejected candidate is required to produce, before his admission to re-examination, a certificate of three months' additional study at a general hospital and a special dental hospital.

"The Inspector reports (pp. 20-22) that the general conduct of the examination, the scope and suitability of the questions asked, and the method of marking adopted, are not only sufficient but leave very little to be desired. He thinks, however, that the examiners should emphasise more strongly than they do their opinion when candidates do very badly at any one portion of their examination in which they are very deficient. He recommends that instead of the single examination which is now held, the examination should be divided, and that candidates should be examined in elementary chemistry and metallurgy as applied to dental art, some understanding of these subjects being quite essential for the intelligent practice of dental surgery.

"The Council of the Royal College of Surgeons of England have no remarks to give to the Report of the Inspector, which they regard as satisfactory, but forward a copy of their new regulations for the dental diploma, which were approved and adopted by the Council of the College on July 9, 1896, in which it will be seen that the recommendations contained in the inspector's report have been met.

"It should be noted that the new regulations adopted by the college on July 9 were the outcome of recommendations of the Board of Examiners in Dental Surgery, considered in May, 1895, and were not the result of the visitor's inspection, although the Council were pleased to find that they coincided with those of the Inspector.

"The Committee regard this Report as a valuable one, and ask the Council to bestow upon it their close attention. The alterations which it contains in both the curriculum and course of examination appear to be in the right direction, and your Committee believe that many are worthy of adoption."

The Council resolved to enter this Report upon their minutes.

Mr. BRYANT next presented the Report on the qualifying examinations in dentistry of the Royal College of Surgeons of Ireland. In this report also, he said, there was a good deal worthy of perusal, but he should follow the same course with respect to it as he had followed in the case of the English college, with this difference, that as the Irish college had, unlike the English, remarks to make on the report, he should read these remarks. The several parts of the report were as follows:—

REMARKS BY INSPECTOR.

"As to the first professional examination, I have none to offer.

"As to the second, I have already mentioned that the practical mechanical might be advantageously extended, and the oral associated with it omitted as a separate part of the examination.

"A somewhat wider question, however, arises. The *sine curriculo* candidate does not have to pass the first professional examination at all, but is at once admitted to the second, which is eminently practical (even as to the questions asked at the oral), and appears to me to be rather too much modelled upon the probable acquirements of the *sine curriculo* candidate.

"Moreover, when once he has obtained his diploma he is not ear-marked in any way, but is indistinguishable from the *cum curriculo* candidate, from whom attainments of a higher order (*i.e.*, a knowledge of the subjects of the first professional examination) are demanded.

"This seems barely fair to the *cum curriculo* candidates, who have so far been very few, as only 14 (2·6 per cent. of the whole number), have obtained the diploma.

"As an argument in favour of the present regulation, it is urged that the *sine curriculo* candidate receives no further legal rights than he already possesses, and does come under the control of the college in the conduct of his practice as regards advertising, &c. Moreover, that if required to pass both primary and second professional examinations, he would probably not come up at all, and so would not come within the control of the college.

"But it is a matter for serious consideration whether, if the *sine curriculo* candidate is to be admitted for any longer period, he should be granted a diploma upon such much easier terms than the *cum curriculo* candidate. Very little knowledge of dental anatomy, none of the anatomy of the head and neck, and practically none of the surgery of the mouth was required of the *sine curriculo* candidates, and whilst I regard the examination test as applied to the *cum curriculo* candidate as fully satisfactory, as he has to pass both primary and final professional examinations, I have some doubts about the adequacy of that to which the *sine curriculo* candidate is subjected.

"With regard to the general question of methods of marking, the more I have seen of the percentage system and its practical application in the making the candidate pass each subject separately the less I like it. In my judgment it is better to let the candidate pass by a total aggregate of marks, so that excellence in one direction may cover slight deficiency elsewhere, and thus to enable an examiner to give to a weak candidate, whom he hesitates to then and there reject, a mark somewhat below the pass proportion, which at present he cannot do fully.

"Thus a candidate may be weak in every part of his examination, so that his examiners would have liked to give him something less than a pass proportion of marks, and yet would have hesitated to reject him absolutely on any single portion or subject.

"In my own experience I have met with many candidates who would stand in this position, and who in their total addition of marks would fall far below the pass standard, but who would probably have been passed in separate subjects, owing to the hesitation of an examiner to summarily reject on one subject alone.

"Such a candidate will certainly be the better for a further period of study.

"Of course the power to reject a candidate upon any one subject, or upon any one part of his examination, should at the same time be retained; it is also to be remembered that the system in vogue at the Irish college is better than that in which each portion of the examination (*i.e.*, paper, oral and practical examination) stand quite alone and separate, in so far that it does give to the examiner an opportunity of giving in one section of a subject marks less than the pass proportion, without then and there rejecting the candidate; unless, indeed, it be in the practical part, and it is quite right that this greater importance should thus be given to the practical part as being the most searching.

"My suggestion is, therefore, that the candidate (unless rejected summarily upon any part) should pass or fail upon the total aggregate of his marks, retaining, however, the feature, which appears to me a good one, that a deficiency of marks in the practical portions of the examination cannot be made up elsewhere.

"And should this suggestion meet with approval, I think that in the apportionment of marks a preponderance should be given to the practical examination in the final professional, which lasts a whole day, but which at present carries no more marks than the paper, nor than the 15 minutes of oral examination. This, however, would only become feasible were a recasting of the general plan effected in the direction of making the candidate pass by a total aggregate of marks. And whilst retaining, of course, the power to reject upon either the operative or mechanical portion of the practical examination, I would extend to this the system of aggregate marks, by marking the practical examination as one whole."

REMARKS BY THE IRISH COLLEGE.

Reply of the Royal College of Surgeons in Ireland to the Report of the Visitor on the Dental Examinations, June, 1896.

"The report of the inspector was remitted by the Council of the Royal College of Surgeons to its dental examiners for their remarks. The criticism of the examiners were duly laid before the Council, and adopted by them as their reply, as follows :—

"Taking up page 19 of the report, the dental examiners wish to draw attention to the fact that the oral examination alluded to in the last paragraph on that page by Mr. Tomes was an examination on orthodontiæ, and not in general mechanics. It was an examination arising out of a case of which the student had been asked to take an impression and to take notes in the earlier part of the day, and it is meant to be more or less parallel to the method of conducting a clinical examination in the medical and surgical final examination.

"The candidates were not taken out from their practical test in the work-room to be examined in orthodontiæ, and the dental examiners cannot agree with Mr. Tomes that it is advisable to take a candidate away, either from his practical operative work or his practical mechanical work in order to examine him orally.

"They think such an interruption may seriously hamper the candidate in these practical tests.

"As regards the examination in practical mechanical dentistry, the examiners were, as Mr. Tomes states, seriously hampered by the number of candidates and the unfinished state of the Dental Hospital premises.

"It has all along been the aim of the College of Surgeons in Ireland to make this mechanical test very thorough, and, in fact, the Irish college has been considerably in advance of the other licensing bodies in this particular ; but as the dental examiners have not before them the reports of the examinations from London and Edinburgh, they have no means of comparing the examinations recently conducted by these corporations with that at which Mr. Tomes was present here.

"In referring to the last paragraph but one on page 19, they find it stated that the candidates were given zinc models and dies to make, bands to make and fit, crowns to strike up, wire to draw down, &c. This covers a good deal of the ground of mechanical dentistry, and, of course, it is impossible at one examination to ask a candidate every detail and method of mechanical work. However, the examiners are of opinion that the strain on the candidate is too great when he is kept the whole of the first day, first at the difficult operative work for some four hours, and then some three hours at hard mechanical work, and they suggest, as an amendment to the present arrangement, the following change of times for such examinations :—

Thursday.

9 to 9.45 Candidates are allotted cases of irregularity—they make notes and take an impression of one such case.
10 to 2 Gold filling.
3 to 6 Papers.

Friday.

9 to 10 *Vivâ voce* in Orthodontiæ.
10 to 2 Practical Mechanical Examination.
3 *Vivâ voce* in Dental Surgery and Dental Mechanics.

"At the conclusion of this examination the marks are made up, the result declared, and the successful candidates sign their names, &c.

"As regards the question whether candidates should be admitted *sine curriculo* or not, the examiners are of opinion that the College of Surgeons is right in adopting the policy of admitting *sine curriculo* candidates to that examination. It is suggested by Mr. Tomes in his report that it is hardly fair to the *cum curriculo* candidates that these older dentists should be admitted to the examination *sine curriculo.* The examiners are of opinion that in the case of men who are already on the *Register*, and who have the right to practise dentistry, and who are of considerable standing, or an average of at least 10 years' standing, and who have shown their anxiety to join the reputable side of their profession by giving up advertising, the College exercises a wise policy in giving them the opportunity to improve their position. The examiners believe that this policy of the Irish College, by which it has gained a control over above a tenth part of the legitimate dentists of the United Kingdom, has done a great deal to advance dentistry towards becoming a reputable profession. In short, they consider the arguments in favour of continuing this policy far outweigh those for abandoning it.

"As regards the suggestions contained in page 23 of the report, the examiners think it would be inexpedient to allow a candidate to make up largely for deficient knowledge in one practical subject by obtaining high marks in a different practical subject.

"The examiners think that the diploma of the College of Surgeons is meant to be a guarantee to the public that the man who has it is able to do for the public either mechanical work or dental operative work; and if this is the meaning that the college attaches to its L.D.S., they think it would be dealing unjustly with the public if it permitted a man to pass who was seriously deficient in a fair knowledge of either of these branches of his profession.

"With these considerations before them, and fully agreeing with Mr. Tomes that additional weight should be given to the practical portion of the examination, the examiners have agreed to advise the following modifications in the marking at the final dental examination:—

Final Dental Examination.

Dental Surgery and Pathology ...	Practical ...	200
" " " ...	Written ..	100
" " " ...	Oral	100
Dental Mechanics, including Dental Metallurgy,	Practical	200
" " " "	Written	100
" " " "	Oral ...	100

"A candidate must (subject to subjoined modification) score at least 50 per cent. in each portion of the examination. He must also obtain an average of at least 50 per cent. in each of the groups.

"N.B.—In case, however, of a candidate who obtains *very good* marks in one of the practical subjects, while slightly failing in the other, the examiners shall have power to pass such candidate, provided his marks do not fall below 45 per cent. in his weak subject.

"The Council of the college resolved, at its meeting of October 15, that the changes in the time table and mode of marking suggested by the examiners be adopted, and that steps be taken to alter the regulations accordingly.—Rob. H. Woods, F.R.C.S., *Secretary of Council.*"

REPORT BY THE DENTAL COMMITTEE.

"This examination was instituted in 1878, after the passing of the Dentists Act, and up to the end of 1895, 504 candidates had been passed out of a total of 629 examined; whereas the *Register* showed that there were 447 Licentiates of the Irish College of Surgeons at that time in practice, and that only four of those hold additional medical or surgical qualifications.

"The *Register* also shows that of the 504 diplomas granted, only 14 were passed *cum curriculo;* and at the present time any person already on the *Dentists' Register*, on production of certificates of respectability, of having been five years in practice, and of not having advertised during the past two years, may be admitted to examination. Ten such persons applied at the examination held in June, 1896, when the examination was visited.

"The Inspector reports that the first professional examination was sufficient and quite satisfactory in all respects; it is however only applicable to the *cum curriculo* candidates. In the second examination the practical part was taken first, as candidates who fall short in this are not admitted to the papers or to the oral examination.

"The examination was pronounced sufficient.

"The Inspector would, however, have liked to have seen the practical mechanical examination extended, and the oral associated with it omitted as a distinct examination, but made part of the practical.

"As the *sine curriculo* candidate is exempt from the first professional examination, and when passed is indistinguishable from the *cum curriculo* so far as privileges are concerned, the inspector thinks it is a matter of serious consideration whether, if the *sine curriculo* candidate is to be admitted for any longer period, he should be granted a diploma upon terms so much easier than the *cum curriculo* candidate — more especially as the Inspector expresses doubt as to the adequacy of the examination to which the *sine curriculo* candidate is subjected.

"The Inspector also in this, as his other reports, finds fault with the system of percentage marking in its practical application in the making of candidates pass each subject separately, the examiner hesitating to give a weak candidate the low marks he may deserve for fear of these marks then and there rejecting him in his subject.

He believes it is better to let the candidate pass by a total aggregate of marks, so that excellence in one direction—and particularly in the practical—may cover slight deficiency elsewhere.

"He would, however, retain the power of an examiner to reject a candidate upon any one subject or part of a subject.

"His suggestion is therefore that the candidate (unless rejected summarily upon any part) should pass or fail upon the total aggregate of his marks, retaining however the feature, which appears to be a good one, that a deficiency of marks in the practical portions of the examination cannot be made up elsewhere.

"The Council of the Royal College of Surgeons of Dublin, in their remarks upon the report of the inspector, dispute some of his criticisms, and assert that it has all along been the aim of the college to make the mechanical test very thorough.

"They admit that the examination work crowded into one day had better be divided, and have now made arrangements to that effect.

"The Council believe that they are exercising a wise policy in still admitting *sine curriculo* candidates to examination, as by so doing they have gained a control over above a tenth part of the legitimate dentists of the United Kingdom, and so advanced dentistry towards becoming a reputable profession.

"They consider the arguments in favour of continuing this policy far outweigh those for abandoning it.

"They agree with the inspector that additional weight should be given to the practical portion of the examination, and have agreed to modify the final dental examination with that object.

"The Dental Education and Examination Committee cannot fail to see that the Royal College of Surgeons of Ireland, by still admitting *sine curriculo* candidates to examination, and exempting them from the first examination, have done their best to neutralise the effect of the Dentists Act of 1878 and to drive dental students to obtain a license elsewhere.

"Indeed, since that date only 14 candidates have passed *cum curriculo*, whilst 490 have passed *sine curriculo*, and so long as the college continues the system it is hardly likely *cum curriculo* candidates will apply in any number."

The Council also resolved to enter the foregoing report upon their minutes.

"Mr. Bryant next rose to present the general report by the Dental Committee on the visitation and inspection of all the four bodies. He explained that it was divided into two parts. The first part was written in December last year for presentation to the winter session of the Council, but it was not considered during the session. It was referred back to the committee with an instruction as follows:—'That it be remitted to the Dental Education and Examination Committee to consider whether it is desirable in any way to modify the existing regulations of the Council as to the course of study and examinations to be gone through by the candidates for licenses in dental surgery, and to report to the Council at the May meeting.' He had not thought it wise to modify that first part of the report, and accordingly he had just completed part two, which showed how the committee had carried out the instructions. However he must read the whole, which was as follows:—

Part I.

"The Dentists Act was passed in 1878.

"On March 26th, 1879, a report by the Executive Committee on the qualifications for registration under this Act was received, entered on the minutes and adopted by the General Medical Council; and on July 19th 1879, the final report of the Dental Curriculum Committee of the General Medical Council was adopted.

"On November 28th, 1894, a report of the Education Committee on the codification of the existing regulations applicable to dental qualifications was received and entered on the minutes.

"On May 26th, 1894, the Council, when considering a report by the education committee on the curriculum for the license in dentistry, agreed to the following resolution, on the motion of Drs. Tuke and Bruce:—

> "'That in order that the Council may be assured that the requirements especially dealt with in this report and other requirements are being fully complied with, they shall, in accordance with Section 22 of the Dentists Act, 1878, appoint an inspector, or inspectors, whose duty it shall be to visit and report on the examinations conducted by the bodies granting qualifications in dentistry, with special instructions to examine

> the schedules and certificates presented by every candidate, and that it be remitted to the Executive Committee to consider the best way of carrying out the inspection.'

"On November 26th, 1894, the Executive Committee proceeded to consider the above resolution, and resolved :—

> "That Mr. C. S. Tomes be deputed to be present at, and report to the Council on, the examinations of the bodies granting dental diplomas, and that, like the visitors appointed by the Council to attend the medical examinations, he be paid his travelling expenses and hotel expenses ;
>
> " 'That the Registrar be instructed to obtain from the bodies granting dental diplomas, the dates of their Examinations during 1895 ;
>
> " 'That the executive committee arrange at its meeting in February the commencement of the visitation.'

"On February 25th, 1895, the Executive Committee resolved :—

> " 'That the inspector be requested to attend the examinations conducted by the bodies granting qualifications in dentistry at such times as may be most convenient to himself during the present year.'

"On June 6th, 1895, the existing Dental Education and Examination Committee was formed, and the report of the committee, based upon the reports of the Council's inspector of dental examinations, is now presented to the General Medical Council.

"The report is headed by a table prepared for the committee by the registrar to show the curriculum as recommended by the General Medical Council, and how far the regulations of the four dental licensing bodies are in conformity with those recommendations.

"It is pleasing to have to report that all the bodies now come up to the approved curriculum, although the scheme of the Royal College of Surgeons of England differs somewhat from that originally laid down—for example, a course of materia medica lectures is not now required in their curriculum, whilst attendance at a recognised general hospital for two winter sessions instead of for one year is called for ; as well as attendance upon a course of dental histology, with separate practical courses of dental surgery, metallurgy, and mechanical dentistry. The Royal College of Surgeons of Ireland also requires two courses of dental surgery and of mechanical dentistry.

"These deviations from the original recommendations of the General Medical Council, it may be observed, in no way depart from the Council's wishes, since they all tend to make the practical part of the course of study more complete.

"The committee would here point out to the Council that whilst there is but one dental licensing board in England and Ireland—(the two Royal Colleges of Surgeons)—there are two in Scotland, viz., the Royal College of Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow.

"This committee fails to see the advantages of Scotland having two dental boards, and would recommend that they should unite and form one conjoint board, so that there would then be but one dental licensing body in each division of the United Kingdom.

"The new regulations of the English college, that there shall be a preliminary science examination, followed by two professional examinations, seem to this committee to be framed entirely in the right direction.

"Under this arrangement, candidates for the dental diploma, before entering at a dental school, may present themselves for the preliminary science examination on the production of certificates of having received instruction at an insitution recognised by the college for the purpose, in chemistry—physics and practical chemistry—these subjects being limited by synopsis ; the examination being equivalent to Part I. of the first examination of the conjoint examining board in England.

"The first professional examination—which includes mechanical dentistry and dental metallurgy—is open to the student after the completion of his three years' instruction in mechanical dentistry under a competent practitioner, and six months' attendance at a recognised dental hospital and school, on production of certificates of having attended a course of lectures on dental metallurgy, a course of practical dental metallurgy, a course of lectures on dental mechanics, and a course of practical dental mechanics, including the manufacture and adjustment of six dentures and six crowns.

"The second, or final, professional examination on dental anatomy, physiology and surgery (including operative work), human anatomy and physiology, and surgery (including pathology), may be passed after the completion of the student's four years of professional study from the date of registration as a dental student, on production of the required certificates as laid down in the regulations, and after the lapse of not less than six months from the date of passing the first professional examination.

"The committee would likewise urge the adoption of Rule IV. in the recommendations of the General Medical Council, as formulated by the examination committee in their report, presented June 9th, 1896 :—

> "'That a candidate remitted in any subject should, before he is admitted to re-examination, be required to produce satisfactory evidence that he has pursued the study of that subject during the interval of remission.' (Vol. XXXIII., 1896, p. 204).

"This committee cannot but express some regret that the Royal College of Surgeons of Ireland has not yet fallen into line with the three other dental licensing bodies, by giving up, as these latter have done, the examination of *sine curriculo* candidates.

"As long as such candidates are admitted to examination, and can obtain a license upon easier terms, *cum curriculo* candidates will not be encouraged to apply for the same qualifications ; and, as a consequence, the good which might have been expected to accrue from the Dentists Act in raising the standard of the dentists' diploma will not completely be attained.

"The Committee are reluctant to recommend to the General Medical Council any material alterations in the curriculum which was laid down after the passing of the Dentists Act in 1879. They are pleased to report that all the examining bodies in essential matters now follow out the curriculum and fairly well maintain the standard of the examination ; where the arrangements of the examining bodies deviate from the scheme they do so in order either to develop the practical branches of the dental art, or towards the curtailment from the course of study or the examination of such subjects as seem to be, or have been proved to be, non-essential. The committee therefore recommend the Council to leave the responsibility of sanctioning these deviations in the hands of the different examining and teaching bodies, under the conviction that by so doing they will, through the experience of these bodies, be helping the solution of the problem as to the best scheme of education and examination of the dental student.

PART II.

WITH RESPECT TO CURRICULUM.

"The changes in the curriculum of 1879 which are now recommended are based upon the collective experience of the four dental examining boards in the United Kingdom, and are by no means revolutionary.

"Thus, in anatomy, in regard to which this Council recommended in 1879 the attendance upon two winter courses of lectures, or as an alternative to the second full course, a short one of not less than twenty lectures on the anatomy of the head and neck, together with some nine months' dissections, it seems that not one of the examining bodies has in recent years called upon their dental students to give more attention to anatomy than is now required of the general medical students who seek to pass one of the conjoint boards, and that the study of anatomy now called for is attendance of a six months' course of anatomy, with twelve months' dissections, including demonstrations.

"The committee therefore recommend the adoption of this change.

"One six months' course of lectures in physiology seems to be generally approved; but the committee would like to see this course helped by a practical one, either introduced as part of the six months' course, or in preference as a separate course.

"The English College of Surgeons adopts the latter arrangement.

"The course of dental anatomy and physiology of not less than twenty-four lectures has proved quite acceptable to the examining bodies, and the course has apparently included human and comparative anatomy. The committee would emphasise the necessity of this arrangement being always carried out, together with instruction in dental histology with the preparation of microscopic sections.

"The recommendations of the Council as to a six months' course of lectures on chemistry, with a practical course of not less than three months, and a separate course of not less than twelve lectures on metallurgy, do not appear to have been closely followed; for one of the examining bodies has included the subject of metallurgy in the course of chemistry; whilst another not only requires a separate course of lectures on metallurgy but a separate practical course on the same subject.

"The committee hesitate at the present time to recommend that this extra practical course should be generally adopted, but would suggest that where no separate course of lectures on metallurgy is given a distinct practical course should be enforced.

"The recommendation that one six months' course of lectures on both surgery and medicine should be required, together with a special course of not less than twenty lectures on dental surgery, is generally accepted; and the Committee would only suggest that in all these courses pathology should be included, as it is most important that in clinical work the examining bodies should show the necessity of such work being based on pathological knowledge.

"The single course of not less than twelve lectures on mechanical dentistry which this Council recommends seems to have been generally looked upon as somewhat limited, since at one college two courses are required and at another a separate course of practical work is called for.

"The committee believe that in this special dental work these deviations from the recommendation of this Council are good, and advise that a course of practical dental mechanics should be added to the curriculum.

"With these slight additions to the curriculum, all of which tend to improve the practical work of the dental profession, the committee advise the subject of materia medica to be eliminated. To require a dental student to attend a three months' course of lectures on this large subject the committee believe to be quite unnecessary, for it seems certain that the therapeutical knowledge which is required by the dental practitioner will be gained during his attendance on the wards of the hospital, the general lectures he is required to attend, and during his four years of practical work.

"With respect to the other recommendations of the General Medical Council the committee have no suggestions to make in the way of alteration, such as—

"Attendance at a recognised general hospital for one year with clinical instruction;

"Attendance on the practice of a dental hospital or dental department of a general hospital for two years;

"The attainment of the age of twenty-one years;

"Having passed a preliminary examination in general education;

"Having been engaged in professional studies during four years;

"Having received instruction in mechanical dentistry during three years;

since all these recommendations seem to be acceptable to all the bodies."

RECOMMENDATIONS WITH RESPECT TO EXAMINATIONS.

With respect to the division and order of examinations for the dental diploma, it does not appear that the General Medical Council has made any recommendations beyond the suggestion that the examinations should as far as possible be of a practical character, and should include actual operations and the preparation of specimens of mechanical dentistry (Vol. XVI., p. 146, 1879). The Council in 1879 clearly thought it expedient to leave all such arrangements in the hands of the examining dental bodies.

It is satisfactory to report that this confidence has not been misplaced, although your committee, as an outcome of the inspections which have just been completed, are of opinion that some improvement in the order and course of the examinations may with advantage be introduced.

(1) They would suggest that the preliminary subjects of physics, chemistry, and practical chemistry—which may be attended before registration—should be passed before, or as soon as, the student enters at a dental school; this examination being made to stand in relation to the dental diploma in the same position as it is desirable that the preliminary scientific examination—which includes the same subjects—should stand to a registrable medical qualification.

(2) That the first professional examination should be open to the student after the completion of his three years' instruction in mechanical dentistry under a competent practitioner, and after registration and six or twelve months' attendance at a recognised dental hospital and school, on the production of certificates of having attended a course of lectures on dental metallurgy, either including practical work or with, if possible, a course of practical metallurgy as well; and a course of lectures on dental mechanics, either including practical work or with a course of practical dental mechanics as well.

This examination should include elementary chemistry, mechanical dentistry, and dental metallurgy; the two former being partly practical and partly oral, the latter by written paper only.

It might likewise include the subjects of dental anatomy and physiology, as well as general anatomy and physiology, if found convenient to the examining bodies.

The practical part of both the first and the second examination should always be made a strong feature.

(3) That the second professional or final examination should be open to the student after the completion of his four years' professional study from the date of registration as a dental student and after the lapse of not less than six months from the date of passing the first professional examination; the student being required to produce evidence of having previously attended at a recognised dental hospital and school:—

(i.) The practice of dental surgery for two years;

(ii.) A course of dental anatomy and physiology, including dental histology;

(iii.) A course of dental surgery, either including practical work or with a course of practical dental surgery as well;

(iv.) A six months' course of anatomy at a recognised medical school and of having performed dissections for twelve months;

(v.) A six months' course of physiology, including practical work, or a separate practical course of physiology;

(vi.) A course of lectures on surgery, including five lectures on the affections of the mouth;

(vii.) A course of lectures on medicine.

Certificates should also be produced of having attended at a recognised hospital or hospitals the practice of surgery and clinical lectures in surgery for one year or two winter sessions; and of being 21 years of age.

The examination should be partly written, partly practical, and partly oral.

It should include:—

Practical anatomy and physiology; dental anatomy and physiology (unless these subjects have been included in the first professional examination); dental surgery and pathology; and practical dental surgery.

An examination in general medicine and therapeutics is not required: the necessary teaching and learning of these subjects so far as they belong to the practice of dentistry being included in the general scheme as laid down.

The report having been put upon the minutes—

Sir WILLIAM TURNER, who in the absence of the President (Sir Richard Quain) occupied the chair, said it was usual, when a report contained a long series of recommendations, such as that just presented did, to precede a motion for the adoption of the report by the consideration of the recommendations seriatim in committee. He should like to know if it was the pleasure of the Council to follow that course in this instance.

Dr. HERON WATSON (Edinburgh), asked whether they should not send down for consideration all these recommendations to the bodies concerned before they discussed the details? In his opinion it would be far better to, if possible, carry the various bodies with them. It was very desirable that they should see this very admirable report by the dental committee, and though that might involve in the first instance a loss of six months, he believed that ultimately there would be a time gain. He was prepared to move accordingly.

Mr. BRYANT was quite willing to follow the course suggested. There were certain matters that might be referred to now, particularly the examination of *sine curriculo* candidates by the Irish college, but these might be noticed by the bodies themselves if the report was sent down to them for their observations upon it.

Dr. MCVAIL (Glasgow) thought the recommendation that the two Scotch licensing bodies should unite should be referred to. He wondered if Mr. Bryant could show how they were to form a conjoint board, for, according to his reading, there was no power in the Dentists Act that would enable them to unite for dental purposes. That being so, and as there was a reflection on the Scotch boards, it was hardly fair that the recommendation should remain in the report.

Sir WILLIAM TURNER remarked that what Dr. McVail had said would be a very efficient answer for the Scotch bodies to make.

Dr. MCVAIL: Well, I want to point out that the two Scotch bodies are entirely blameless.

Dr. RENTOUL and Mr. BRUDENELL CARTER pointed out that section 38 of the Dentists Act of 1878 gave full powers to form a conjoint board.

Sir WILLIAM TURNER: Well, attention has been drawn to the matter, and no doubt these bodies will satisfy the Council with regard to it.

Dr. HERON WATSON moved that the recommendations of the committee, together with the whole report, be sent down to the four bodies with the view to their expressing an opinion on the same, and that these opinions be brought before the Council in November, before the Council come to a decision on the committee's recommendations.

Dr. BRUCE, the direct representative for Scotland, seconded the motion, which was carried unanimously.

QUESTIONS PUT TO CANDIDATES.

Saturday, May 29th.

At this day's sitting of the General Medical Council, Mr. Thomson, President of the Royal College of Surgeons of Ireland, asked leave through the chair to call attention to a statement in Mr. Tomes' report on the examination for the diploma in dentistry of the Royal College of Surgeons of England, and to invite an explanation from the representative of that body.

Leave was at once granted.

Mr. THOMSON explained that the whole mass of these reports on the examinations of the bodies who gave diplomas in dentistry had gone down to the various colleges for consideration and report to this Council next session, and he noticed in the report of Mr. Tomes in regard to the examination in London, one or two statements to which he thought the attention of this Council should be drawn, because it was quite possible that these statements might have some considerable effect upon other licensing bodies. Mr. Tomes said that the general conduct of the examination, the scope and the suitability of the questions asked and the methods of marking adopted, left little to be desired, and if members passed to the report of the Dental Education and Examination Committee of this Council, which was signed by Mr. Bryant, as chairman, they would find that the committee regarded this report as a valuable one, and asked the

Council "to bestow upon it very close attention. The alterations which it contains in both the curriculum and course of examination, appear to be in the right direction, and your committee believe that many are worthy of adoption." They had, therefore, this report sent down to the other dental licensing bodies with the declaration of the inspector as to the excellence of this examination, corroborated by the report of the dental education and examination committee, who had considered Mr. Tomes' observations, that the changes had been in the right direction and that the examination was one worthy of adoption. Therefore, it was not unlikely that other bodies might consider the question whether they ought not to model their examinations upon this one, which was sent to them in this way. Now, he asked the attention of the Council to one or two points in the report of the examinations in surgery of this body. Remember the examination was for gentlemen who were to receive the license to practise dentistry pure and simple. In surgery the following present a fair sample of the questions asked—the treatment of parotid fistula, tongue-tie and its treatment, removal of the tongue, sebaceous cyst of the scalp, dermoid cyst, wound of the radial artery, and so on, until they came to gummata and the stages of syphilis and their treatment——

Dr. RENTOUL: Is this for a surgical qualification?

Mr. THOMSON said it was for a qualification for drawing teeth—for dentistry pure and simple. He wanted to call the attention of the Council to this, which had come before them formally, which had been received and entered upon their minutes, and which had been sent down with the stamp of their approval to the other dental licensing bodies. And he wished to know from Mr. Bryant, who was chairman of the Dental Education and Examination Committee and the representative of the Royal College of Surgeons of England at this Council, whether he thought that an examination in surgery for gentlemen who were to be dentists, whether such an examination was one quite adapted to the purposes of this qualification? If they were to proceed upon these lines, they would be putting the dentist into a much better position than the licentiates or members of any college of surgeons in the three kingdoms, because they were not only testing his capacity to deal with the whole subject of dentistry, but they were enlarging his powers to the recognition and treatment of syphilis and the treatment of sebaceous cyst of the scalp. For himself he did not see the connection between the scalp and the teeth, nor between syphilis generally and the teeth. He could understand that certain syphilitic sores about the mouth might be recognised and examined upon, but upon the general question of the stages of syphilis and the treatment thereof, he thought this Council ought to say something with regard to limiting the scope of the examination. They were apparently about to create a new order of practitioners, gentlemen who were to be dentists and who were to know a great deal of what the general surgeon knew ; in fact, to make a class of practitioners who in some respects were to be superior to the ordinary members and licentiates of the various surgical corporations. He, therefore, thought it was a matter of urgency.

Mr. BRYANT said he would like to give an explanation in a very few words. The Dental Education and Examination Committee at the end of their report said that they regarded the report of the inspector on this examination of his college as a very valuable one, and they asked the Council to bestow upon it very close attention. Those remarks were drawn up in the first report before the question was returned to them for reconsideration. They felt that the line which his college had adopted in the way of examinations was good, and although they were not prepared then to recommend to the Council a scheme drawn up very much on the lines adopted by his college, they thought it would be right to call the special attention of the other examining bodies to what the College of Surgeons of England was doing, so that they personally might frame their own schemes somewhat on the same line. In the second report, however, many of the arrangements adopted by his college had been included, and so these remarks, which were made in the first report, were really realised in the second one. He would make no comment on, and he raised no objection to the remarks which Mr. Thomson had offered with respect to the examinations of his college. It was quite right that he should call the attention of the Council to the subject. Of course, for a dentist to talk about the removal of the tongue or the treatment of sebaceous cyst of the scalp seemed to be a little beyond his province, and he had no fault to find with Mr. Thomson saying it. At the same time, if one put down a series of questions given at any examination, there was never the slightest difficulty in raising objection to one or two of the questions. In this case they had a large series of questions, and he thought upon looking through them, they were on the whole, quite satisfactory. He was pleased, however, to have his attention called to the matter, and he would put it before the college.

Monday, May 31st.

THE DENTAL EDUCATION AND EXAMINATION COMMITTEE.

At this sitting of the Council, Dr. Reid, Professor of Anatomy in the University of Aberdeen, was appointed to take the place of Dr. Angus Fraser on the Dental Education and Examination Committee.

THE DENTAL COMMITTEE.

There was a contest for the vacancy in this statutory committee created by the retirement from the Council of Mr. Wheelhouse, Filey (Yorkshire). The nominees were Mr. Brudenell Carter, the representative of the Apothecaries' Society of London, and Dr. Glover, London, one of the direct representatives of the English medical practitioners, and, on a vote, the former was elected.

Abstracts and Selections.

PORCELAIN FILLINGS.

By ELOF FÖRBERG, Stockholm, Sweden.

I HAVE been using porcelain fillings on a large scale since 1883. The material I use is of three kinds: (1) artificial teeth; (2) cylindrical bars; (3) body and enamel for fusing. Of artificial teeth the English ones, I consider, are the best, as their substance is more homogenous than that of the American, and they are therefore more suitable for grinding. I use the American (How's) crown only when it is a question of repairing a broken corner of an incisor, where more or less of the cutting edge has to be replaced, and when, therefore, with a view to strength, platinum pins are considered requisite. This crown is hollowed out at the back, and therefore very thin, and it is provided with four thin, pliable platinum pins, which can advantageously be used as fastenings for the porcelain filling.

My method of using parts of artificial teeth as fillings has been explained by me at the meeting of the American Dental Society of Europe, at Coblenz, in 1887. It is briefly as follows: Having completely excavated the cavity and finished the edges, I take a piece of coloured paper, or somewhat thick tin-foil, and hold this over the tooth surface with one hand, while with the other hand I rub the paper with a polishing-steel, so that the edges of the cavity cut through the paper. In this way I get a mould which perfectly shows the form of the cavity. This mould of paper or tin-foil is then stuck on, with varnish or something similar, to an artificial tooth, the colour of which corresponds with that of the tooth to be fitted, when it should be observed that the curvature of the surface of the artificial tooth should be tolerably in accordance with that of the natural tooth; it is preferable, especially in cases of a larger defect, to place the mould on that part of the artificial tooth which corresponds with the position of the defect of the natural tooth.

Going by the mould, glued on to the tooth, it will now be easy, by using cutting pliers and corundum or carborundum wheels, to form an inlay that will perfectly fit the cavity, and this can be done in the laboratory, so that all that remains to be done in the operating-room are the finishing touches, which must be from the cavity direct; before doing so the mould should naturally be removed, and the inlay fastened on a metal mandrel with gum-lac or a mixture of wax, rosin, and guttapercha, which mixture is very suitable for sticking on pieces with (as well as for using as temporary fillings). When the piece has been accurately fitted, and everything has been made ready for the filling, the piece should be fastened in the cavity with Harvard cement. The cement, which should be well stirred and rather thin, is applied around the edges of the piece, which is then quickly pressed into the cavity, where it should be held with a steady pressure for some minutes to prevent its being displaced by compressed air or otherwise before the cement hardens. Only a thin layer of cement now separates the tooth from the porcelain inlay. The colour of the cement should be a shade darker than that of the tooth. When How's crowns are used the piece should, of course, be fitted so that one or two of the platinum pins may be used as fastenings.

If, when, for instance, repairing a partly broken tooth, it is desired to have, on the palatine or lingual side, a material which, better than cement, can resist wear, the cement on that side may be covered with a thin layer of amalgam, or with gold, or one can, before inserting the piece, add melted glass or porcelain, thus forming the contour of the tooth. This course of action is preferable to making the parts entirely of glass or porcelain, inasmuch as one then gets a harder and stronger piece, and it is also then easier to get precisely the shade of color that is wanted.

The porcelain cylinders are naturally intended for cavities which have or can be given a cylindrical shape : thus, particularly for incisors with enamel defects, etc. The cylinders should be about twenty millimeters long and from one-and-a-half to four millimetres in diameter, or nearly corresponding with the inlay drills that are met with in the market. The porcelain substance ought to be thoroughly burned, so that on breaking or grinding it one gets a firm and bright surface, and should be of such shades of colour as are mostly met with. My method of using such porcelain cylinders, for which method I claim priority, is as follows : A cylinder, of suitable colour and a little thicker than the drill used, is fixed in a porte-polisher with gum-lac or the guttapercha mixture previously referred to. When rotating in the machine the cylinder is clasped round with a corundum cloth held by the left hand, and is thus ground (slightly conical) until it can just be pushed into the cavity. The cylinder is then moistened with water or glycerine, is dipped into fine carborundum powder, and while rotating, is introduced into the cavity, where it will then be perfectly ground in. In doing this the hand-piece must be held very steadily, with only a slight pressure on the cavity to prevent the cylinder from breaking. The corundum powder is then washed away with water, the cavity is dried, and the cylinder tried. The end of the cylinder is now ground off somewhat, so that the piece, when placed, rests close against the walls of the cavity. It is better not to use too fine a corundum wheel for this grinding, as the cement will adhere better on a rough surface. If the cavity is not too shallow no other fastenings are required for the piece. The cylinder is then marked to the depth it enters into the cavity, and it is then cut nearly off at that place with a thin diamond or carborundum wheel. A thin layer of cement or gutta-percha solution is then applied round the sides of the cylinder, which is then inserted into the cavity with a firm pressure, and held there until the cement has partially hardened. With a slight movement of the hand the cylinder is then broken off at the place cut through. Some melted wax or paraffin is then poured on with a spoon-shaped instrument. The piece is not polished until the cement has hardened well. If these cylinder fillings are carefully done and well polished with Arkansas stone, etc., it is quite impossible to distinguish them from the natural tooth when standing a few paces off. The advantage of this method with cylinders instead of common inlays is that the cylinder can safely be fixed in a porte-polisher, and thus ground against a corundum wheel and cloth, as well as in the cavity itself, without the risk of slipping, which, with small inlays, generally is the case, even though they be fixed on metal mandrels. The cylinders can also be used for cavities of an oval or other shape when they are ground in as common inlays and cut off as previously described. Even then one has the advantage of being able to hold the piece well fast while working.

The way of using enamel for moulding is well known. I only want to mention a few details of my way of procedure. Having pressed the gold-platinum foil well up, thereby using cotton and polishers, I pour some hard wax (consisting of one part of wax and two parts of rosin) into the mould thus obtained. I then pack the wax well, while it is hardening, and also press it over the surface of the tooth. By this means I get a very good cast of the cavity, and also prevent the gold-platinum mould from altering shape while being taken out of the cavity ; and, lastly, I can get a plaster-cast model of the tooth, whereby I can better see the shape of it when forming and fusing the porcelain filling. I now mostly use Reisert's enamel, which is melted in an oven. In order to obtain a natural colour a somewhat yellow enamel should be used at the bottom, and on top of that the colour chosen. I generally also add some continuous-gum body to the first layer. I formerly used a heated instrument for pressing the inlay into the cavity, but it seemed to me as if that rendered the cement less durable. In cases of approximal cavities I generally use a thin linen band for pressing in the piece and removing the superfluous cement.

The question as to what cavities are particularly suitable for porcelain and glass fillings I think I must answer as follows : Fillings of the kinds mentioned are suitable for visible defects in the incisors, cuspids, and (possibly) bicuspids. I have used Roustaig's cement as long as it could be had, and afterwards Harvard cement. As regards the question how long a time these fillings will last, it depends upon three factors,—viz.: (1) the condition of the cavity, (2) the degree of thinness to which one has succeeded in reducing the cement layer, and (3) the amount of attention the patient gives to his mouth.

The cavities should not be too shallow (especially not cervical cavities, in which it is, as a rule, difficult to get durable fillings). I have several cases where porcelain fillings, in large cervical cavities of irregular shape, as well as in cavities which cover the whole of the approximal surface and half the cutting edge of incisors have lasted ten to twelve years, nothing having been done to them in the meantime excepting refreshing the cement strip a little once or twice. The most durable are naturally the cylinder fillings, because, having rotated and ground itself into the cavity, it fits so perfectly that the cement layer is absolutely as fine as a hair. Here, as elsewhere, hygiene plays an important part. To insert a series of porcelain fillings into cervical cavities on a person who, on account of neglect (or of chronic gingivitis), has the cervical parts of his teeth covered with deposits is, I consider, labour totally thrown away.

The last question, whether porcelain fillings can be considered as a satisfactory substitute for gold, aside from æsthetic considerations, has previously been partly answered by the mentioning of porcelain fillings which are now ten to twelve years old, and which, by all appearances, may last as long again. It may generally be said that porcelain fillings can rival gold fillings in durability in cases where they, with a minimum cement layer, touch upon tolerably firm enamel edges, and where, in biting, their surface does not articulate against the opposite teeth.—*International.*

LOGAN CROWNS.

I HAVE often been asked what is the best method of banding a Logan crown. That is a hard question to answer, but I will briefly explain how I do it. We all recognize the fact that when properly adjusted the Logan crown is one of the strongest we have, but fitting it is where we have the trouble. After having selected the tooth for the case I prepare the root to receive it the same as for a

Richmond crown, making the sides parallel and slightly conical, and cutting the root slightly under the gum, the end being finished with a root-facer. I next make a tight-fitting band of 22k 30-gauge gold, only letting the band extend under the free margin of gum. Next prepare the canal for the pin and proceed to grind the crown until I have secured the proper length and position of tooth. Remove the band and solder a piece of 24k 34-gauge gold on end, letting it project slightly in all directions, particularly to the lingual and labial surfaces, placing it in position on root, puncture the cap and force the pin through and the crown to position, remove the cap with crown, and you will see the difference in size of the root and crown. Grind the neck of crown, reaming it to as near the size of band as possible, and fit a second band tightly around the porcelain. Replace the cap on root and trim band on crown until a joint is made with the tooth in position, remove the cap with tooth, and with hard wax unite the band to cap, and remove the porcelain. Wire the two pieces together and solder the band to cap, putting the solder on the outside of band. Finish up the edge and cement the band to crown and on root. One of the advantages of this method is that, should the root be out of line, the crown can be set at any angle to strengthen it.—*Dental Headlight.*

COATING CASTS FOR VULCANITE WORK.

A Plan has recently been suggested for this, but as it was invested with a certain amount of ambiguity, we have been at some trouble to find out what was meant, and how to make the preparation, for the benefit of our readers. Procure a quarter of an ounce of collodion, add to this three-quarters of an ounce of sulphuric ether, so as to thin the collodion down, and pour into the bottle containing these a package of silver gloss. Silver gloss is a preparation of tin and zinc, and may be obtained of all dealers in paints, oils, putty and other materials for house painting. Though called silver gloss, it contains no silver. It comes put up in papers of an ounce or more, in the form of an impalpable powder. It unites, to a certain extent, with the collodion, when shaken, and is applied to the face of the plaster cast, as well as to the reverse of the investment in a case flasked for vulcanite work, with a camel's hair pencil, leaving a very even and thin film over these which effectually prevents the adhesion of the vulcanite to the plaster, permitting the case to come from the flask clean. The silver gloss may be had at slight expense enough to last for a year or more with ordinary use. It should be kept in a well-corked bottle, and the pencil cleaned after use. Should particles of it adhere to the plate it can be entirely eaten off by immersion in a bath of nitric acid and water—one quarter acid, three-quarters water; but this we have not found necessary, as it comes from the flask clean.—*Dent. Office and Lab.*

ARISTO-PARAFFIN WAX FOR ROOT-CANALS.

By Harry B. Hickman, D.D.S., Philadelphia, P.A.

The paraffin obtained from petroleum or by distillation of cannel coal, or wax containing sufficient stearine to raise its melting point above the temperature of the human body, will answer for the purpose here described. That obtained from petroleum is preferable, because less subject to chemical alteration, and therefore less liable to develop irritating qualities. It also, for the same reasons, remains permanently aseptic.

The average druggist can tell, approximately, the melting point of the wax he sells, which will generally be found sufficiently low for the purpose intended.

Mix the aristol and paraffin by application of slight heat and by means of a spatula till the mass assumes a dirty straw colour. This mixture will not deteriorate with age, and can be kept in glass or in a pasteboard box. Paraffin wax as found in commerce is a more or less impure hydrocarbon, but it will not volatilize unless raised to a high temperature.

After the dam has been applied and the canal has been sterilized and prepared as usual, it should be desiccated thoroughly by use of chloroform or alcohol with hot-air syringe, or by use of a root-canal drier. When this has been accomplished, roll a cone of aristo-paraffin and place in the canal, and with a heated root-drier or other pointed instrument touch the wax, when it will fill the canal by capillary attraction.

When the canal is filled, to all appearances, the material can be forced up through the apical foramen by means of a round-head burnisher and a pledget of cotton or bibulous paper, or by twisting cotton around the sharp point of a plugger, when by the slight irritation evinced by the patient for the instant it will be known that the canal is filled. Experiments with this prepartion on extracted teeth demonstrate through what surprisingly minute foramina it can be forced.

The advantage of using aristo-paraffin, where the foramen is large, is that, if it is forced through the foramen, it will not produce sufficient irritation to cause or continue an abscess, but be absorbed by the tissues, which advantage can hardly be claimed, righteously, for any other filling of the same value in other respects. When the canal is thus filled, the bottom of the cavity should be covered with cement, and the filling completed as conditions indicate.—*Cosmos.*

INVESTING MATERIAL.

One of the best investments for metal cases that are required to withstand a very high degree of temperature, is a mixture of two parts of not too fine plaster of Paris to one part of ground asbestos, grade 3, that has been passed through a No. 12 sieve to rid it of any coarse fibers. If the plaster is strong, a little less of it may be employed in the mixture. This will not crack or shrink.—*Dental Practitioner and Advertiser.*

TO MAKE A SOLID GOLD CROWN.

Stamp cusps of thin soft platina and trim to size. Proceed to articulate. It may be dinged or bent to suit the case. Now melt it full of gold scrap of any desired grade. It will now be found that while the platina has retained the shape of the cusps its colour has almost entirely disappeared. If any remain and is likely to be exposed, it may be removed in the finishing process.—R. E. Sparks, *Dominion Journal.*

AN ANTIDOTE TO CARBOLIC ACID.

Vinegar is an antidote to carbolic acid. When applied to the injured surface it causes rapid disappearance of the characteristic whiteness, as well as of the anæsthesia, and also prevents the formation of a slough.—Professor Carleton, *in Semaine Medicale.*

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Original Communications.

A SLIDE FOR FIXING REMOVABLE PORCELAIN FACINGS.

By MR. DOUGLAS LOGAN, L.D.S., Edin.

ONE result of the rapid progress of dental surgery and pathology has been to considerably extend the operation of crowning, and at the present time the surgeon has at his service a great variety of crowns both useful and beautiful. The most useful of the faced crowns is undoubtedly the Richmond. Æsthetically it is perfect, its well-fitting cap protects the root from the ravages of bacteria, and its nicely contoured lingual surface permits of easy and constant cleansing; hence this crown is deservedly popular where the restoration of a visible enamel surface is concerned.

And yet, inspite of all this, it must be admitted that the Richmond crown is woefully unscientific; for should the porcelain become fractured there is no hope of replacing it. Many of these crowns, once lovely as a poet's dream, are now going about the country looking hideous as a nightmare, an everlasting heartache to their creator and a perpetual annoyance to the patient.

In a recent issue of one of the dental journals, it was stated that in the case of the Richmond crown, it is generally possible to replace the porcelain without removing the metal work from the mouth. But any one possessing the most elementary knowledge of metallurgy, and who has only *seen* a Richmond crown, must know that it is quite an impossibility to replace the facing without removing the rest of the crown, and even then none but a humourist would dream of replacing it. True, many very ingenious methods of "tinkering" a broken Richmond have been advanced from time to time, but one must not confuse the words "tinker" and "replace." By the former is meant *repair*, as understood by the Hibernian car driver, who restores his broken harness with a piece of string. The latter, however, can only be exemplified by such a result as that obtained in replacing a broken tooth on an ordinary gold plate. Here, there is no introduction of alien substances, no loss of strength, but everything is restored to its pristine beauty and usefulness. Can a broken Richmond crown be restored in this manner ?

It was with a view to remove this objection to all porcelain faced crowns that a series of experiments were commenced last winter, and the result has been so satisfactory that these crowns may now be fixed in any part of the mouth, without any apprehension whatever, for fracture of a facing can be quickly and thoroughly repaired. The Dental Manufacturing Company have produced a slide made of platinised gold, which will be found equally useful in crown, bridge, and plate work.

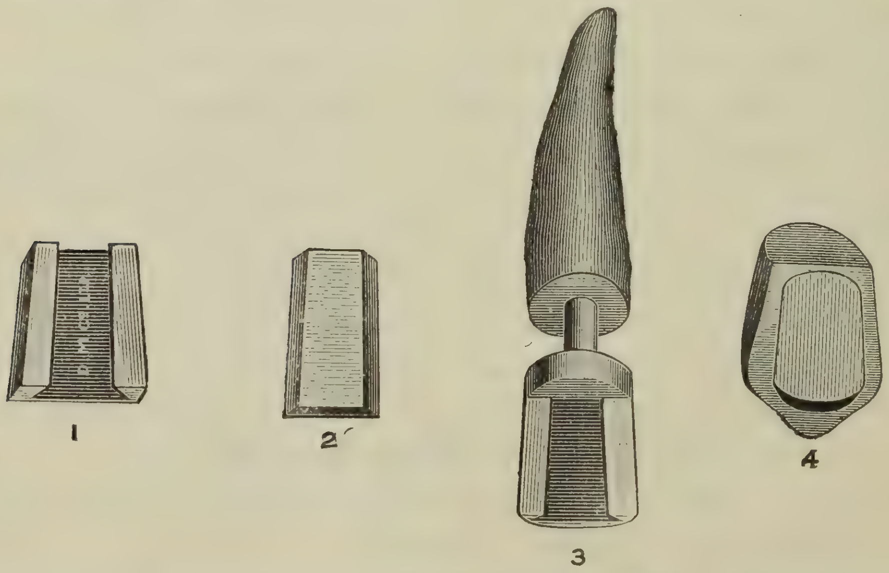


Fig. 1.—The double-grooved portion of slide. Fig. 2.—The longitudinal strip. Fig. 3.—The grooved portion mounted on cap and pin. Fig. 4.—The longitudinal strip fitted and trimmed to back of tooth.

It consists of two parts, a narrow longitudinal strip (Fig. 2), which forms a backing to the tooth, and a double-grooved piece (Fig. 1), which receives the former and secures the whole to the crown, bridge, or plate, as the case may be. The first or male part of this slide, is just broad enough to allow the pins of a tooth to pass through, and it slightly tapers from the cutting edge of the facing, while the entire slide is almost as thin as No. 8 plate.

As to the method of mounting ; let a gold plate be taken, and suppose it desirable to place thereon four incisor teeth, which, owing to a close bite, must be soldered, and two or more bicuspids and molars on either side, fixed in vulcanite. It is obvious that, in the usual order of things, a troublesome repair arises should one of the incisors become broken, for the vulcanite must be removed from the plate before the tooth can be replaced, and considerable time is spent in re-vulcanising. In order to avoid this altogether, take four slides, back each incisor with the male part, using a sharp drill and the dental engine, and piercing the metal on a block of hard wood. Let the pins be easy in the holes, and countersunk on the surface away from the porcelain. Place the backing on the tooth and fix it, either with wax, binding wire, or by bending each pin away from the middle line. Now invest it in wet sand, or marble dust and plaster—the former is quicker—apply the usual flux, carefully and sparingly, and solder with a low carat solder. Pure gold makes a poor joint on platinum, and a well-alloyed, or low carat gold solder is therefore necessary if good contact between the pins of the tooth and the backing is to be expected. Moreover, excess of solder must be avoided, only one very small piece for each pin is necessary.

Having treated all four teeth in this manner, submit them to the process of cleansing in hydrochloric acid, and then cut down the platinum pins to the level of the backing, which now presents a perfectly even surface. On applying the backed tooth to the female part of the slide, some difficulty may arise in getting the two into perfect correspondence. But if a little oil be placed on each side of the backing, the slide will work easier, and, with a little perseverance, the tooth may be tightly driven home. The entire slide is now too large for the tooth, therefore it must be trimmed to the facing, as shown in Fig. 4, with a fine file, and this being done, the tooth and slide are ready to fit to the model and plate. The four teeth, with slides attached, are applied to the plate in the usual manner. Each slide, and part of each facing resting on the plate, and the teeth are left a little too long, for reasons to be hereafter explained. A sparing use of hard wax at the junction of slide and plate will temporarily unite the two, and, after oiling the neighbouring parts, a little quick setting plaster should be run over the backs of the teeth, extending down to the plate and just covering the excisive edge of the teeth, leaving the entire facing exposed in front. Modelling composition may be used instead of plaster, and with almost as much confidence. The plaster being set, the plate is removed from the model, and the teeth, with slides, from the plate, but the plaster must not yet be disturbed. Withdraw the teeth from the slides, and return the female part of each slide to its former position, the hard wax which was allowed to remain will again fix it. Now carefully paint the exposed metal with a mixture of chalk and water to prevent the possibility of solder getting where it is not wanted, *i.e.*, into the grooves of the slide. Oil the plaster, and invest in sufficient marble dust and plaster to keep the slides and plate together; remove the plaster when the investment is quite set, and solder the slides to the plate. There is no need to wait for cooling, therefore quench immediately in water, cleanse in hydrochloric acid, and place the plate on the model. Again, trouble may arise in replacing the teeth in the slides, but a little oil and patience will smooth matters; and if things are very obstinate, the lips of the grooves may be raised. Relieve the slide as little as possible, however, for when the teeth are in position they must be fitting tightly, and firm enough to resist removal with the finger and thumb, therefore proceed cautiously. Having succeeded in getting the facings home, they are now fine fitted with carbon paper. This will serve to render them perfectly secure, and it was for this purpose that they were originally left a little too long. Let it be remembered that the slide tapers, and consequently the more the tooth is fitted the more secure it becomes. Again, trim the edge of the metal, and after polishing, the front part of the denture will be completed. The bicuspids and molars may now be attached in the usual way. The fastenings for vulcanite would of course be fixed before the incisors were fine fitted, as would also the pins if tube teeth were used; and the whole case may now be finished.

Should a facing subsequently break, seize the platinum pins of the fractured tooth with a pair of pliers and withdraw the backing. Cut the pins off and drill out the holes, fix a new facing as before, and in half an hour the damage will be perfectly repaired.

The method of applying the slide to crowns and bridges is practically the same: the following instructions for making a crown will therefore serve for both.

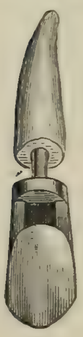


Fig. 5.—The finished crown showing tooth partially pushed home.

Let a cap be made, as for a Richmond crown, place it on the root, and pierce for the passage of the pin which is driven into the previously prepared root canal. Take now a small plaster impression of the cap and adjacent teeth, and bring the pin and cap away with it, otherwise replace them. Marble dust and plaster may now be run into the cap and drawn up towards the end of the pin so as to form a cone. When set this and the entire impression is thoroughly oiled and afterwards poured, and in due course the model is opened out. Now remove the cap with its inferior investment, place immediately on a block and solder pin and cap together. Quench at once, cleanse and return it to the model. The facing and slide are now fitted to the cap in the manner described for the plate, and everything proceeds as before. The crown may now be fixed in the mouth, and should fracture of the facing occur a new tooth may be adapted in a few minutes.

One particular use of this slide in bridges may be mentioned, though many others may suggest themselves to ingenious minds. In removable bridges the span may be neatly and securely attached by a slide at each pier. The female part of the slide may be soldered to the pier, the male part being fixed by its upper border to the span, forming a very secure structure, which can be readily removed.

In conclusion, much credit is due to the Dental Manufacturing Company for the excellent workmanship of this slide, and for the trouble taken in its perfecting. So beautifully do the parts fit, that the tooth will be perfectly secure. and will remain so without the assistance of cement, mastic varnish, or any such substance whatsoever. Moreover, being made of platinised gold, it is not only very strong but high carat gold solders may be used in mounting it without fear of sweating.

Reports of Societies.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The concluding meeting of the session was held on the 14th of June, Mr. R. H. Woodhouse, the President, in the Chair.

Mr. A. J. Makepiece, Mons. E. Beltran, of Marseilles, and Mr. Rupert Wheatley, of Torquay, were elected members of the Society.

The Officers and Councillors for the ensuing year recommended by the Council were unanimously elected as follows :—

PRESIDENT—Mr. W. E. Harding. VICE-PRESIDENTS—Messrs. Boyd-Wallis, J. Ackery and C. West (resident), and Messrs. J. F. Cole, M. MacGregor and W. A. Hunt (non-resident). TREASURER—Mr. W. H. Woodruff. LIBRARIAN—Mr. W. A. Maggs. CURATOR—Mr. Storer Bennett. EDITOR OF TRANSACTIONS—Mr. J. F. Colyer. HONORARY SECRETARIES—Mr. J. H. Mummery (foreign), Mr. H. Baldwin (Council), and Mr. J. O. Butcher (Society).

COUNCILLORS—Messrs. Smith, Curnock, Gould, Albert, Kluht, Williams, Clayton Woodhouse, Badcock and Bateman (resident); and Messrs. Cunningham, Mason, Andrew Washbourne, Amoore, Ackland, Matthews, Hughes and Fothergill (non-resident).

The LIBRARIAN (Mr. W. A. Maggs) in his annual report, stated that during the past years forty-three members and fifteen visitors had made use of the library as compared with thirty-two members and forty-two visitors in the previous year.

The TREASURER (Mr. W. H. Woodruff), submitted his annual statement, and gave the items of receipts and expenditure, the former (including annual subscriptions, £452 11s. 0d.) amounted to £531 4s. 3d., and the latter to £504 4s. 10d., leaving a balance of £26 19s. 5d. The investment account stood at £4,378 16s. 3d.

The CURATOR (Mr. Storer Bennett), in the course of his annual report, said that all the specimens having been shown and described at the time of their presentation, he did not propose again to describe them ; but they had all been put upon the table so that members not present at the particular meetings at which the specimens were shown, might have an opportunity of examining them. He would be glad if members would take a little more interest in presenting specimens to the museum. Some members were indefatigable, and the Society certainly was very much indebted to Mr. Morton Smale, who, beyond all others, during the past two or three years, had presented a large number of very valuable specimens. He regretted to say that only a small number of people had made use of the museum, except on the evenings of the meetings, the number being so small that he was hardly justified in recommending the museum being open two nights a week and paying a Sub-Curator to attend.

Mr. STORER BENNETT exhibited a lower canine tooth, very much decayed, with two well-marked roots, which had been presented to the museum by Mr. James Clarke. He also showed a very interesting specimen, kindly lent by Mr. David Hepburn, of a portion of an elephant's tusk, which had evidently been injured by a bullet or spear—probably a leaden bullet from the appearance of the sinus. A hole, apparently, had been made in the thin skin that was developed at the time of the injury, producing a sinus of about one-and-a-half to one-and-three-quarter inches, a large amount of secondary dentine developed in the pulp cavity, and perfectly normal ivory had been produced.

Mr. SYDNEY SPOKES exhibited a home made denture, apparently made of a piece of sheet iron, upon which three bone blocks had been rivetted with iron rivets. It was removed from the mouth of a man aged 78, shortly after death, who had worn it for thirty-two years, and who said he made it himself when an engineer in the Portsmouth Dockyard. He was admitted to Chelsea Infirmary last year, and complained of severe toothache. On the nurse looking into his mouth, she saw the plate, which we have before us, loose enough to wobble about. Mr. Spokes was sorry to be unable to present the original to the museum, but had great pleasure in presenting a plaster reproduction.

Dr. J. E. GREVERS, of Amsterdam, then read a paper entitled "Notes on Various Forms of Articulation of the Upper and Lower Jaw." He said that having entered upon an investigation into the anatomical changes in certain deformed upper jaws, and not finding sufficient material in the anatomical museum of Amsterdam, he visited those of Vienna and Paris, and their museums of Anthropology, and it was while looking over their extensive cranial collections that the question of the occlusion of the teeth was forcibly put before him. A certain deformity which specially interested him at present was also marked by a certain abnormality in the occlusion of both upper and lower teeth, and in searching for examples of this it was but natural that other variations than the one he was looking for should come under his observation·

Variations in dental occlusion were frequently met with, and to even a superficial observation it became evident that all the variations could be reduced to a limited number of groups. In looking over the dental handbooks, he found almost all of the varieties more or less fully described ; but there seemed to exist an uncertainty in their nomenclature which might cause confusion, and he felt once more the urgent need of a terminology which would be definite, concise, and, if possible, universally applicable. An attempt in this direction was made by Carabelli in 1844, and in more recent years (1891), by Sternfeld, in the first volume of Scheff's *Handbook of Dentistry*. Both these classifications Dr. Grevers had applied to his own cases, and compared their usefulness. The former did not seem to have been received favourably by the profession, not having been even adopted or reproduced in a single dental handbook. Probably the contradictions to which the system lead might account for this. In the article in Scheff's handbook Sternfeld introduced a nomenclature which had for its basis certain expressions which are used in anthropology. He recognised two classes of dental occlusion, a physiological or ethnological, and a pathological. When the abnormality was limited to the upper jaw, the suffix "gnathic" was used, and "genia" when to the lower jaw. The prefixes, ortho-, opisto-, and pro-, expressing the position of the teeth, whether straight, backward, or forward. It seemed to Dr. Grevers very questionable, if not objectionable, to make use of terms which in another branch of science possessed a definite meaning, and to apply them differently to special and pathological cases. In the classification of Sternfeld there was no room for the class of teeth occlusion known as open bite and cross bite. Before the Dental Section of the International Medical Congress, held in London in 1881, Isslay, of Budapest, read a paper in which the author proposed a new nomenclature, and ten years later the same author published a short paper, which might be considered a revised and condensed edition of the one read before the section in the International Medical Congress. The nomenclature proposed seemed to Dr. Grevers not only correct, but also perfectly logical and highly practical. To do away with the misnomer "articulation of the teeth," Isslay substituted the word "odonthamosis." To determine the variations in odontharmosis, it was desirable to find some fixed or quasi-fixed point, and for this Isslay had selected the upper jaw. According to the position of the lower teeth they had the following possibilities in odontharmosis—

1. Enarmosis=projectiug upper teeth, normal bite.
2. Epharmosis=projecting lower teeth, underhung bite.
3. Prosharmosis=edge to edge bite.
4. Opharmosis=open bite.
5. Discharmosis=cross bite.
6. Tyrpharmosis=mixed up bite.

Subject 1. Enarmosis. The upper teeth fall just in front of the lower ones, leaving hardly any space between the labial surface of the lower and lingual of the upper teeth, thereby covering the lower teeth but for a small distance.

Supposing the same condition to exist, with this difference, that the space between the upper and lower teeth was much larger—projection of the upper jaw—then they had still an enarmosis, the upper teeth biting completely in front of the lower teeth, but no more an ex-enarmose (normal bite). Here they placed the forefix dia to enarmosis and called this condition a di-enarmosis. This projection of the upper jaw might amount to a few millimetres or more. Still another form of enarmosis might present itself, *i.e.*, the upper teeth might cover the labial surface of the lower ones entirely, and these again strike hard against the palate. This condition was said to be dysenarmotic—dys-enarmosis.

Again, it was possible that a combination of the two last-mentioned sub-forms of enarmosis might be met with, *e.g.*, strong projection of the upper teeth, with deep occlusion of the lower ones against the hard palate; such a case could be perfectly and at the same time clearly described as dys-dy-enarmotic.

In the next group (2. Epharmosis) they had just the reverse of the first group. Here the lower teeth came in front of the upper. Here, also, three possibilities might present themselves. They might have an en-epharmosis, that is to say (1) the lower teeth would touch the upper ones, leaving no space between them, a di-epharmosis, the space was much greater, but the upper were not entirely covered over by the lower teeth, and a dys-epharmosis, the lower ones covered the upper teeth entirely, leaving very little space between. A combination dys-di-epharmosis was possible.

The third group, Prosharmosis, comprised those cases in which the upper and lower teeth met edge to edge.

The fourth group, Opharmosis, included those cases in which, on closure of the teeth, the molars and bicuspids met, but a greater or less open space was left between the front teeth.

Sometimes instances were encountered in which the odontharmosis was such that the upper row of teeth met the lower one crossways, for instance, on one side the teeth stood enarmotic, and on the other side pros- or epharmotic ; or, on the other hand, the lower jaw might be responsible for the deviation. This was called dicharmosis, or cross-bite.

In the last group were taken up those cases which could not be classified under any of the preceding groups, the odontharmosis being so mixed up that almost every tooth had a different kind of mal-position. Under this head might be arranged certain cases of complicated irregularity.

It might be objected that in this classification no regard had been given to the etiology of the various forms of odontharmosis. This he beleived to be no serious objection to the system. For instance, a dienarmosis might be due to a contraction of the upper jaw, or to an eversion of the teeth, and if the etiology were known, it might be appended ; *e.g.*, *dienarmosis ex contractione maxillæ superioris*, and so on.

Another objection might be raised against this system of classification in that there was no room for certain " pectoral " expressions as senile mouth, in which the teeth of the upper and lower jaw are inverted ; but this did not really detract anything from its value, as in these cases the odontharmosis might just as well be enarmotic or prosharmotic, if not epharmotic.

A large number of photographs illustrating the points of the paper were projected on a screen.

Mr. STORER BENNETT said it would be very unfair that the paper should go undiscussed, but at the same time everybody would admit that it was very difficult, if not impossible, adequately to enter into a discussion of such an elaborate and so exceedingly profound a paper at such short notice. He congratulated Dr. Grevers on the very beautiful series of photographs he had shown, and also congratulated him upon living in a City where they had such a magnificent collection of skulls as they had in Amsterdam. At first sight it would appear to be a very complete method of describing the various differences in the arrangement of the teeth. Whether it was likely to become general or not it was only possible to say after the paper had been studied carefully and quietly. He was afraid the members would find it a little difficult to assimilate all the new names brought forward in the short time they had been before them.

Mr. TOMES said he did not like to let Dr. Grevers' paper pass entirely without a word, and yet he was still more unwilling to seem in any way to throw cold water upon the elaborate and very complete classification. Dr. Grevers would forgive him for saying that the value of the classification depended entirely upon the value of the facts to be classified. It was of very little use to invent a number of descriptive terms which should designate correlated conditions unless those conditions were themselves worth tabulating and describing. It seemed to him that a classification like the one brought forward would stand or fall not by its descriptiveness, not by whether it would designate in intelligible language certain conditions, but by those conditions being found to be important and correlated with other matters. He did not mean to say that they should not have a means of briefly describing a purely accidental thing; but if many of the conditions described proved to be accidental and not to be correlated with other facts of importance then he did not think that the introduction of fresh terms was desirable. As a teacher he did not like fresh terms. The advocates in America of the tri-tubercular theory of the genesis of teeth and the Kineto-genesis, and all the various other sorts of words they had invented had become a nuisance. Some of their terms had obtained currency while it was exceedingly doubtful whether the facts that those terms intended to embody were true. It was very doubtful whether they did express facts or whether they expressed theories, which might be very transient. It seemed to him that Dr. Grevers in his investigations would do a great service if he could show with what those abnormalities were correlated, whether they were accidental or part of a chain of events. If a terminology like that which Dr. Isslay and Dr. Grevers had elaborated enabled him in his work to briefly describe things instead of describing them at length it would be very useful, but whether it would attain general currency appeared to him to depend on the nature of the facts which it endeavoured to describe, and which at present he thought they did not know.

Dr. WALLACE thought the paper was a very interesting one. It appeared to him that in many of the dental terms that were used there was a confusion brought in by using words that were used in comparative anatomy in different senses altogether. Dr. Grevers' system seemed to avoid that difficulty, and therefore he thought there was considerable value in the system. It was based on facts. It was merely a nomenclature that gave, as briefly as possible, a representation of the facts, and it had a great advantage over the American system of nomenclature which had been referred to He thought it would be very advisable to consider the subject seriously and that great benefit would be derived from adopting some such system as that which had been put before them so ably.

Mr. W. A. MAGGS said that from what he could understand of the paper the nomenclature seemed very good, and anything which would enable them to understand such conditions by a single word was certainly an advantage. If he might offer a criticism it would be to say that he should like to see eliminated from the specimens which had been shown all those which might be looked upon as pathological. The normal occlusion of skulls was what one would like to appreciate in such classification and not some of those which appeared to be pathological. Dr. Grevers might say that they were all pathological, but what he meant was some of those which had occurred during life due to pathological conditions and not as they were born. For instance, in Mr. Tomes's book on Dental Surgery there was a prognathic jaw due to burns or some cicatricial tissue; he supposed Dr. Grevers would hardly put that under one of his classifications?

Dr. GREVERS in reply, thanked the members heartily for the kind reception they had given his paper. In reply to Mr. Tomes he said that happily or unhappily he lived in a very small country where a two hours' journey by train would take him into a different country where a different language was spoken. In Holland they were polyglots and spoke different languages and so far there was no trouble for them to read foreign books. But in England and in the United States it was different. In English books and German books the various forms were described with peculiar names. For instance he did not think anybody would understand what greizenmum meant. It might be a mouth without teeth, such as was found in old people, or it might also mean a mouth where teeth stood inverted and gave that peculiar expression. It might also be that greizenmum might be produced by a projecting lower jaw or he would call it epharmosis or di-epharmosis. He fully agreed with Mr. Tomes that new words should not be coined. Dentists certainly suffered from bad nomenclature, but it was doubtful whether they were worse off than others were in medicine. In medicine he thought there were a great number of names which were not correct and it was the duty of each one of them to try and get a correct nomenclature.

The PRESIDENT alluded to the great bereavement sustained by Mr. Howard Mummery in the death of his wife, and proposed a letter of condolence should be sent to him by the Society, which was unanimously agreed to. The President then delivered his valedictory address, the first portion of which was occupied with a review of the various papers and discussions which had taken place during the session. Speaking of the losses the Society had incurred through death and resignation, he specially mentioned the deaths of Dr. Magitot, of Paris, and Sir Benjamin Ward Richardson, reminding the Society that the latter was one of the oldest of its members. He was pleased to say that the number of new members made good, numerically, the losses the Society had sustained. The important question to which he alluded in his opening address as to the future domicile of the society had not been neglected by the Council, and although a final solution had not been yet reached, matters were so far matured that his successor and the Council would find the difficulties that had surrounded the question much simplified. Mr. Woodhouse then gave some account of his trip abroad, and said that the enforced rest had not only benefited his health, but had afforded an opportunity of visiting Cape Colony, Natal, the Transvaal and the Orange Free State, and of getting some insight into what the profession was doing in these parts. The importance of a special training and value of proper credentials was being recognised by the powers in both Cape Colony and Natal, but the Colonies still lacked the *esprit de corps* which in England bound them together in a common brotherhood. Before vacating the chair he tendered to the members and the Council his best thanks for the regular attention at the Meetings, and to the Secretaries for their close attention to the inner working of the Society. He congratulated the Society on their choice of his successor, Mr. W. E. Harding, who, he said, was one of his oldest friends, and one whom to know was to respect and admire. He wished the society, under Mr. Harding's leadership, every success.

Mr. HEPBURN, in proposing a vote of thanks to the President, said he was particularly glad that the duty had fallen on him, because the name of Woodhouse was an honoured name in the profession. At the very outset of dental reform in England the name of Woodhouse was associated with it, and as far as he could see the name of Woodhouse was not likely to die out for many generations yet to come. As an old President of the Society he determined he would attend every meeting of the Society during the past session, but on one or two occasions, through illness, he was unable to do so. He mentioned that because he felt it was very gratifying to a president and to the members of the Society to see the past Presidents present at the meetings. If the old Presidents knew how much pleasure and gratification they gave to young members of the Society by coming to the meetings they would attend more frequently than they did. Mr. Woodhouse had most conscientiously fulfilled every duty that fell to his lot, and he had presided over the meetings of the Society and the Council with all the tact, ability, and geniality which was to be expected of him. They thanked him for his services and wished him long life and prosperity, trusting that when he vacated the chair his interest in the Society would not cease, but that they would see him frequently amongst them in the years to come.

Mr. BADCOCK seconded the motion, which was carried with acclamation.

The PRESIDENT briefly replied.

Mr. W. HERN proposed a vote of thanks to the other officers of the Society, which was acknowledged by Mr. Clayton Woodhouse, and the session then terminated.

THE DENTAL RECORD, LONDON: AUG. 2, 1897.

ALVEOLAR HÆMORRHAGE AND MENSTRUATION.

MOST of us have been troubled at times by cases of hæmorrhage following tooth extraction in a female, and recognising the fact that hæmophilia does not occur in women, have been, perhaps, at a loss for a satisfactory explanation. It is possible that we may, at a previous date, have extracted a tooth for the same patient without any such untoward result, and the second extraction may have been no more severe than the former, and, indeed, a little tearing of the tissues around the tooth, should, if anything, check bleeding, since this implies stretching and twisting the vessels, thus diminishing or obliterating their lumen. It has been suggested that the real cause of this hæmorrhage is that the patient at the time of the extraction is menstruating, or is about to menstruate. The inquiries which the writer has made, in the few cases he has met with, have not lent any great support to the idea; but there is much in the idea which commends itself as probable, and various cases are recorded which give it a certain amount of support. Thus, Dr. Rudolf Dorn, at the annual meeting of Bavarian dentists, at Munich, on June 30th, 1897, brought forward a case, published in the *Odontologische Blätter*, which he regards as one of *menstruatio vicaria*. It was a patient, 20 years of age, of weakly build. He had previously extracted a tooth, and no undue amount of bleeding followed. On May 5th of the present year, about seven o'clock in the evening, he extracted a lower molar, no unusual force was needed, the gum was not torn, and when the patient left the bleeding had ceased. About eleven o'clock the following morning the patient returned with profuse hæmorrhage, the mouth being full of clots, and the blood still oozing away. The bleeding, she said, commenced about three hours after going home and had not ceased since, though cold, alum and vinegar had been applied. Dr. Dorn plugged the sockets with iodoform gauze, covering it well with a pad of "stent." The following morning he removed the dressing, and believing that the hæmorrhage had permanently ceased, he dismissed the patient. About six the same evening the bleeding recommenced and the dressings were reapplied as before. A couple of days after the dressings were again removed and the wound healed in the usual way.

Now the interesting feature about the case was this. Her periods were usually regular, she menstruated in April and again in June, but in May menstruation, which should have occurred at the period of the above mentioned hæmorrhage, was absent. Curiously, a similar occurrence had coincided with severe hæmorrhage from the nose a couple of years previously. Dr. Port read a paper, on a similar subject, before the same society at their February meeting, which can be found in the May issue of the *Monatsschrift.* He quotes several cases mentioned by different writers. Thus, Parvin (*Trans. American Gynæcological Soc.*, 1876-78), described a case of hæmorrhage from the mucous membrane of the mouth, which occurred every four weeks, the menses being absent. While Gutmann, in a paper read before the Odontologische Gesellschaft, at Berlin, 20th February, 1890, gave several authenticated cases of severe hæmorrhage occurring when teeth have been extracted during menstruation, though extraction at other times had not been followed by a like occurrence.

In view, therefore, of the undoubted fact that hæmorrhage is more prone to occur at such times, whether it be true vicarious menstruation or simply due to increased vascular tension, it would be wise to postpone extractions, especially the extraction of many roots.

News and Notes.

At the Annual Meeting of the Western Branch of the British Dental Association, held at Exeter, on July 23rd, Mr. J. T. Browne-Mason was presented with a pair of silver bowls by the Branch—first as a very small acknowledgment of his long and faithful services, and secondly as a means of conveying to him their congratulations upon his silver wedding. The bowls were very handsome, and had for supports polished ebony plinths. One of the bowls contained an inscription, and the other the initials of Mr. and Mrs. Browne-Mason.

Mr. T. A. Goard, the Secretary, was presented with a silver salver of antique pattern, on the occasion of his marriage, and as a mark of esteem and acknowledgment of his services.

The Western Branch adopted the proposal of the Council that the Parent Association be invited to visit the Western Branch at Bath for 1898, and that Mr. Hunt be suggested as President.

The *Breslauer Zeitung*, of July 17th, records the death of a Frau Bode, of that city, during the administration of Ethyl-Bromide, by a "Zahntechniker" for the extraction of a tooth. The patient was only 24 years of age and healthy. Three medical men were fetched, but the patient was already dead.

"Anecdotes" has interviewed a "young dentist in a large London practice." Amongst other things, nitrous oxide gas becomes the topic. "Do patients ever die under this anæsthetic?" "Well, very, very rarely, but I believe one or two cases have occurred. You see it all depends upon the heart, and no person suffering from any affection of that organ should dream of taking the gas. For local anæsthesia, cocaine is now very popular. This is usually administered in cases such as I have just referred to, where the heart is not strong or is diseased." Doubtless he is "very young": in time the teacher will find time to learn.

On July 22nd the Birmingham police were informed of the death of Thomas William Green, 30 years of age, a clerk, of Sycamore Road, Handsworth. Deceased had been suffering from toothache and had been advised to have a number of teeth extracted. For this purpose he went to the rooms of Messrs. Cave-Brown Cave and Mountford, of Bennett's Hill. It was deemed advisable to administer an anæsthetic, and while under the influence of this, death occurred.

The summer meeting of the members of the Edinburgh Dental Hospital and School was held on July 15th, in the Institution, Chambers Street; Bailie Sloan presiding, in the the absence of the Lord Provost. Mr. Bowman M'Leod submitted the report for the past session, in the course of which it was said that they had every reason to be proud of the continued and increasing success of the school as a teaching institution. During the past year they had enrolled 22 students, a number equal to that of any previous year. The number on the roll at present was 49, and while it was hoped that the number would be decreased by the successes of the men going up at the end of the month, is was trusted that the roll would be augmented by entrants at the beginning of next session. Of the number at present on the roll, 22 were first year's men, 22 were second year's men, and six were third year's men. Year by year more attention was being paid to the conservation of the teeth, as was evidenced by the table of work done from 1st July 1896 to the present. He was also pleased to say that while the ultilitarian value of the dental appliances made in the Laboratory was never lost sight of, the prosthetic possibilities of the cases were becoming more and more a matter of emulation among the students entrusted with the construction and fitting of the dentures. In regard to the work during the year from 1st July, 1896, it was reported that the conservation cases numbered 6,075, and that the patients in operation in the surgical department numbered 4,545. The prizes for hospital work, as usual, had been well contested, the student who received the senior medal being Mr. J. H. Gibbs, who last year was at the head of the junior division. The Chairman afterwards presented the medals and prizes to the successful students.

THE Edinburgh Dental Students' Society's summer clinics were held on the evening of Monday, June 28th, in the Conservation Room of the Dental Hospital. Mr. J. Graham Munro, in filling in a cavity with gold, demonstrated the practical usage of Dall's mallet whilst Mr. J. S. Amoore showed a very neat way of making and finishing a crown. Extraction by the combination of "Nitrous Oxide and Oxygen" was shown by Mr. G. W. Watson, the lecturer on Dental Surgery, who also kindly undertook the ethyl chloride demonstration. "Cocaine and Eucaine" injection by Mr. J. A. Young, one of the assistant surgeons, was notable for the marked toxic effects which followed the use of cocaine, but the administration of several antidotes successfully terminated an interesting series of clinics.

THE Golf Club in connection with the above society has also just terminated what must be considered a most successful summer season, both as regards the number of members and the excellence of the prizes. On June 12th, a competition was held on the links at Kinghorn, Fifeshire, the principal prize, presented by Mr. J. Morris Stewart, the House Surgeon, being won by Mr. J. N. Macdonald, whilst the second and third prizes, from the club funds, were won respectively by Mr. McKendrick and Mr. Sutcliffe. On July 3rd, the students travelled to Bathgate to compete for a case of pipes, presented by Mr. Fred Page, together with the usual club prizes for second and third winners. Mr. McKendrick secured the first prize, closely followed by Messrs. Inglis and Sutcliffe. Altogether these Saturday afternoon outings should become most popular with the students and thanks are due to the Hon. Sec., Mr. G. R. Brittan, for the excellent manner in which he handles the club.

THE following gentlemen, having passed the necessary examinations, have been admitted Licentiates in Dental Surgery of *The Royal College of Surgeons of England.*—Ackland, Donald ; Bell, Robert John ; Brown, James Warburton ; Cooper, Percy Henry Rogers ; Douglas, James Carfrae ; Duncan, Frank Hubert ; Forsyth, William Frederick ; Heath, Arthur Reginald ; Hey, Stephen Daniel ; Lees, Charlie ; Powell, Mathew Pearce ; Reading, George

Frederick; Rogers, David de Sola Cohen; Rowe, William Francis; Smart, Edwin Herbert Jacob; Smith, Edward Percy; Smith, Thomas William; Summers, Gilbert Hamilton; Thew, Thomas Wilton; Westron, Henry; Williams, Sydney Herbert; Wilson, George Edward—*students of the Charing Cross and Dental Hospital of London.* Jones, William Henry; Roper, John Langdon; Woodhouse, William Barnabas, M.R.C.S., Eng.—*students of Middlesex and Dental Hospital of London.* Austen, Harold William Colmer, M.R.C.S., Eng.—*St. Bartholomew's and Dental Hospital of London.* Wallis, Charles Edward, M.R.C.S., Eng.—*King's College and Dental Hospital of London.* Brown, Charles Every; Brown, Ernest Chadwick; Cook, Percy Herbert; Cooper, Albert; Floyd, Walter; Harrison, Sydney; Holmes, Robert Gabriel Stuart; Jacobs, Jacob Michael Cecil; Oddy, Alfred Ernest; Picnot, Ernest; Smith, Edwin Wylde; Styer, Albert St. John; Wallis, Elton George Whishaw; Wilson, Charles Albert—*students of Guy's Hospital.* Canton, Loftus Henry; Everett, Charles—of *The Middlesex and National Dental Hospital.* Arnold, John Cressey—*London Hospital and National Dental Hospital.* Robertson, Arthur Edwin—*St. Bartholomew's and National Dental Hospital.* Lishman, James; North, Benjamin; Stoner, John Walton; Tidswell, Oswald—*Owen's College, Royal Infirmary and Victoria Dental Hospital, Manchester.* Robertson, Robert Percy—*University College, Royal Infirmary and Dental Hospital, Liverpool.* Sadler, Bernard Frederick; Shedden, Arnold Ward; Willis, Stuart—*Mason's College, Queen's and General Hospitals and Dental Hospital, Birmingham.* Fourteen gentlemen were referred back to their professional studies for six months.

THE DENTAL HOSPITAL OF LONDON.

A Conversazione at the Galleries of the Royal Society of British Artists, also the occasion of the Annual Prize Distribution, was held on the 20th ultimo.

The Dean, in opening the proceedings, said it was usual for the Dean to make some remarks, but he would be as brief as possible

Their School, "in spite of all temptations" to go to other places, such as Edinburgh, Glasgow, Birmingham, Sheffield, Manchester and Newcastle, continued to maintain its numbers, the entries being larger than ever, and he was glad to say their successes were also greater than they had ever been before. It was the misfortune of all Hospitals to lose some of their Staff from time to time, and they had lost from their Staff Mr. Storer Bennett and Mr. Truman. Both these gentlemen had served them well. Fortunately the successors were worthy of those who preceded them, these vacancies having been filled by the appointment of Mr. Norman Bennett, a Saunders Scholar of former years, and Mr. Douglas Gabell a distinguished student at the Hospital. He must say something about their new hospital. Last year he stated that they had secured the site, and he could now say that he believed that they had secured the best site in London. He believed it was the best, because, in the first place, it had a north light and could not be built upon in front. It was also in a central position, and further, he was glad that they were remaining in Leicester Square, as it would be recollected that they were first brought there by Sir Edwin Saunders, to whom they owed so much, and the continuity of association would, therefore, be upheld. The plans had been accepted, and in a very short time building would be commenced. There was another side to this question, it was impossible for a poor charity to carry out a scheme of this magnitude without public support, and he was sorry to say the public did not support them as they deserved. In order to carry on the work they had been obliged to obtain a mortgage on the site, and the first repayment of £1,000 became due at the end of the present month. It had been said that help came to those who helped themselves ; well, the Staff and the Dentists through the country had helped them in a most admirable manner, and so he had sufficient faith that the public would come on very shortly and give them their support Mr. Morton Smale concluded by reading a list of further subscriptions that had been made.

Sir Frank Lockwood distributed the prizes as follows:—*Saunders Scholarship*—Mr. T. H. Miller, M.B., B.Ch. *Ash's Prize*—Mr. T. H. Miller, M.B., B.Ch. Class Prizes—Winter Session, 1896-7—*Metallurgy*—The 1st and 2nd prizes are divided equally between Mr. T. H. Miller and Mr. T. W. Thew. *Dental Mechanics*—1st prize, Mr. N. Miller; Certificate of Honour, Mr. T. W. Thew. *Operative Dental Surgery*—1st prize, Mr. N. Miller; 2nd prize, Mr. T. W. Miller; Certificates of Honour, Mr. T. H. Miller and Mr. S. D. Hey.

Summer Session, 1897—*Dental Anatomy*—1st prize, Mr. T. H. Miller; 2nd prize, Mr. N. Miller; Certificate of Honour—Mr. J. W. Hislop, Mr. Manning, Mr. Z. J. Gibson. *Dental Surgery*—1st prize—Mr. T. H. Miller; 2nd prize—Mr. W. H. Thomas; Certificates of Honour—Mr. N. Miller, Mr. J. W. Hislop, Mr. A. G. Payne and Mr. O. C. Penfold.

Sir FRANK LOCKWOOD then said he had had during the last ten minutes perhaps the greatest pleasure that could fall to the lot of any man, namely, to give away a large number of prizes to which he had not contributed a penny. Nothing is more satisfactory than being beneficently benevolent, but one had to pay for such a privilege, and the payment was no light matter in his case. He was asked some weeks ago to give away the prizes to the Students in the Dental Hospital of London; well, he knew a little about dentistry, but not very much, and he certainly felt that he was going to pass through one of the most trying ordeals of his life. However, he did what every one else did in similar circumstances, looked to see who was his predecessor, and wrote for a report of his speech to, as far as he could, repeat it. Well, that was just what he endeavoured to do, he wrote for a report of their Society and he carefully read the report—particularly the report of the occasion on which the prizes were distributed in 1896—and he saw that they were distributed by his excellent friend, Sir Crichton Browne. They applauded, but they did so because they heard that speech; unfortunately, he did not hear it, and when he came to the report all he could learn from it was that "Sir Crichton Browne made a most excellent and instructive speech." He could very well imagine that that would be so, because Sir Crichton Browne was speaking on a subject about which he was very familiar as a professional man, not as an amateur. The amateur spoke from an entirely different point of view, and he (Sir Frank Lockwood) was merely an amateur. He came before them as a member of another profession—he thought equally unpopular.

He supposed if there was one thing that a man liked less than going to see his dentist it was going to see his lawyer. Probably he got more out of the former than of the latter ; at any rate, when he had finished with the dentist he knew the worst, but that was not so with the lawyer. He had had an opportunity of learning something about their Hospital, and he hoped that all present and many who were not present took a great interest in it. He understood *in primis* the object was to give gratuitous advice and perform operations amongst people who could not afford to pay for the necessary aid that the Hospital gave them. Well, surely that should be a claim upon all of them, and should excite their warmest sympathy and admiration for such an institution. And then, its secondary object was to afford a school for teaching purposes. He did not know whether such an institution was for dentistry pure and simple—if he might use the expression—it was said "to the pure all things are pure," but if the lawyer were simple, well, God help him ! for if God did not no one else would, and therefore he did not know whether he was right in comparing their profession with his own. He understood that their students were men who were going to follow dentistry and dentistry alone through life. Well, he did not wish to criticise that. He thought dentistry was a branch of surgical aid well able to stand alone ; but he must say that in country districts it would be well if medical men had at least an elementary knowledge of the subject, because he could never forget the picture, by John Leech, of the man to whom, after being dragged three times round the room, the practitioner remarked, "Well, that is not bad for a first attempt." He therefore thought it would be well for the medical practitioners to avail themselves of the opportunity no doubt afforded by this institution for instruction. He did not know, but he supposed that in the dental profession, as in other professions, great strides had been made during the past few years, and he had no doubt they found prevention better than cure. Our teeth were invariably the cause of trouble to us from our earliest years until we got rid of them, and had artificial substitutes, and he thought that much of this might be overcome if parents could be properly impressed with the importance of the frequent inspection of the teeth of children, more particularly in their earliest years. Judging by the prizes he had

had the pleasure of distributing there were higher flights of learning included in the dental curriculum than would seem to be implied. He did not know whether there was another school in this country which was carried on in so exhaustive and admirable a manner. They would forgive him if he put in the first place the reflections which occurred to him as to the educational side, but there was another side, the people who were not able to pay for surgical advice. He was very much struck by a comparison of figures on the report of 1874 with that of 1896. In 1874, there were 19,255 cases treated at the Hospital, a very substantial amount of relief; but in 1896 he found that the nineteen thousand odd became 57,654, which meant that the enormous number of people relieved in the earlier year had been almost trebled. Now this immense number of people had no doubt received adequate advice and assistance at their hands. Without wishing to flatter them he would offer them his sincere congratulations. He thought it was in "Much ado about Nothing" that Benedick declared he "had the toothache," which occasioned the surest laugh in a not unamusing play. The man who had to go out to earn his bread by the sweat of his brow, or by manual toil, felt the gnawing and continuous pain of toothache as much as the judge, or bishop, or any other exalted person. Thank God there was a Hospital like theirs which had done so much to alleviate pain and suffering amongst those unable to pay for it, and although there were many present who were applauding their Students they might depend upon it there were many more who were thankful to them and the Staff for what they had done, and he was sure they would feel that gratitude a full and adequate return. His last words to them were might they go on and prosper, and if it was necessary that they should receive the assistance of the public no doubt they would do so. They had done a great and good work, and had done it faithfully and well.

Mr. Storer Bennett moved a vote of thanks to Sir Frank Lockwood for his address, and Mr. C. S. Tomes seconded the resolution, remarking that he would not be betrayed into making a speech after Sir Frank Lockwood, who possessed the rare gift of a light touch, both with pencil and in speech, whether in the Law Courts or on the platform, without in any way diminishing the weight of what he had to say.

Sir Frank Lockwood briefly acknowledged the vote.

The remainder of the evening was pleasantly spent in listening to an excellent programme of music and recitations.

Abstracts and Selections.

NEW METHODS IN PROSTHETIC DENTISTRY.

By Dr. T. C. West, Natchez, Miss.

In the construction of a vulcanite denture, a more life-like appearance is obtained, and greater accuracy and greater strength secured, than by the old method of procedure, by the adoption of the following innovations:

1. After securing an accurate plaster cast, coat it with rubber-cement (the "amber cement" supplied by the Chase Combination Dental Plate Company is excellent for this purpose). Into the cement press closely on to the cast, with thumbs and fingers, black vulcanizable rubber, which will adhere to the cast. If there are any depressions on the alveolar ridge the black rubber should be thickened at those points to even up the surface.

2. The next step is to vulcanize this—but only about three-fourths the usual time of vulcanizing a rubber plate. This forms what may be called *a base plate*, which is to be tried in the mouth and trimmed to accomodate the muscles. It will be found that this will fit the mouth better than the ordinary vulcanite plate, because it has been pressed closely on to the cast with the thumb and fingers, escaping the screw pressure in closing the flask after packing, which is so apt to distort or obliterate the finer features of the cast. The rugæ are also nicely represented, the rubber over that portion being of uniform thickness.

3. This vulcanized piece is now used as a base-plate in "taking the bite," which place in the articulator and carefully fill the palatal portion of the vulcanized base-plate with plaster.

4. The bite wax is removed when the plaster has hardened and the surface of the base-plate washed with chloroform, benzine or gasoline, the alveolar ridge portion coated with amber cement and covered with a sheet of red rubber—not extending it over the palate.

5. The teeth are now warmed and pressed into the red rubber. It will be found that the rubber will bulge over the necks of the teeth, forming a very natural festoon, without any spatulating. (Teeth with a slight groove at the neck, such as are made for celluloid work, are the best for use in this method.)

6. The next step is to place a strip of wax to cover the pins of the teeth, being careful not to melt it. In this condition the piece is tried in the mouth, and any desired changes in the position of the teeth made by removing the tooth, warming it, and resetting as desired, while the piece is in the mouth.

7. Now a piece of modelling composition is used to fill the vault and form a support for the lingual faces of the teeth.

8. When this is hard, the teeth are removed and a *thin* sheet of pink vulcanizable rubber is warmed and placed over the labial and buccal surfaces extending over and into the depressions from which the teeth were removed, each tooth being then warmed and returned to place, the sockets in the modelling composition showing the exact position of each tooth.

9. Now coat the surface of the pink rubber with light tinfoil—it is not necessary to use heavy foil, as no screw pressure is to be used in this process.

10. Next put the piece on the cast which was poured into the vulcanized base-plate (see 3) and place it in the shallow portion of the flask, building the plaster up so as to support the buccal and labial faces of the teeth.

11. The modelling composition is now removed, as also the wax from the pins of the teeth, and for this purpose it may be necessary to use hot water.

12. Coat the teeth about the pins with amber cement, and put in red rubber, cut in small pieces, so as to anchor the teeth ; coat with a layer of tinfoil, and—without either soaping or varnishing the plaster—fill the upper portion of the flask, put in the bolts, and vulcanize in the usual way, *regardless* of the partial vulcanization of the black rubber base-plate.

When the piece is removed from the flask it will be found that there is no excess of rubber and no filing or scraping to be done. It is only neccesary to rub the surface with a stick wrapped with bibulous paper, dipped in a dish of pulverised pumice, moistened with water, alcohol, or, best of all, with chloroform. This can, of course, be followed with chalk and a piece of chamois skin or flannel, and the rubber bleached by placing in a dish of alcohol in the sun. By this method there is saved the time usually spent in "waxing up"; the time spent in waiting for the plaster in the flask to harden in order to remove the wax; the time consumed in packing, heating up and screwing down the flask, and the time required to scrape and finish up the piece, also preserving the hard vulcanized surface-portion of the rubber.

Method of Modelling Gum Festoons.—Having vulcanised the base-plate as in (1) and (2) the teeth are waxed on as usual, but instead of carving up the gums, lay a strip of moldine over them closeto the necks of the teeth. Punch holes in a semi-circular piece of very thin rubber dam and stretch this over the teeth, care having been taken not to have any wax between them. Now stretch the rubber dam back over the moldine, which by a little manipulation through the rubber forms the gums very nicely. Where necessary the rubber can be turned back and moldine added until proper contour is given.

The piece is now flasked with the rubber dam still covering the moldine. When the flask is opened and the wax washed out the rubber dam is removed, carrying the moldine with it. The piece is packed in the usual way. After vulcanizing, it will be found that the gums have a smooth surface of good form and that there is a happy abscence of that dirty little piece of rubber down in between the teeth, which by the ordinary method gives so much trouble.

TREATMENT OF DEVITALIZED TEETH.

By Louis Jack, DD.S.

The subject of preparation of the pulp-cavities of devitalized teeth and of root-canal filling has been so constantly written upon that it is difficult to present any line of treatment possessing newness. In accepting your invitation, the only thing available is to give the methods pursued by me in daily practice.

The subject is divisible into three sections: 1. Where the pulp has been freshly devitalized; 2, old devitalizations where no infectious conditions appear to exist; 3, old devitalizations where diseased conditions are apparent.

In respect of each of these classes, the preparation of all cases require such formation of the cavity or a special opening into the pulp chamber and canals as may give directness of approach, to permit complete access, to effect cleansing of the root-canals and their subsequent occlusion. In respect of this, as applied to the upper molars and bicuspids, the best access is found by cutting through from the occlusal surface. But when the aspect of the cavity is mesio-proximal and the cavity large, choice must rest, of opening sufficently from that direction, as otherwise the tooth will be unnecessarily weakened. Should the cavity be on the distal aspect, thorough preparation requires opening from the occlusal surface. The same principle of conserving the strength of the tooth applies to the incisors and cuspids. When they are strong, the approach is best from the lingual aspect, and where weak from the carious cavity.

Concerning the inferior molars and bicuspids, when the cavities are on the mesial proximate surfaces, the choice rests to open here with sufficient freedom. When the cavity of decay is on the distal surface of these teeth, the best approach is from the buccal aspect at a point near the cervix. In respect of this choice it is not necessary to make a large opening, since, by extending it laterally in each direction and also downward, the distal canal, and also the mesial one, can be easily opened, and may be filled through a comparatively small opening in the molar, and with the bicuspid, by drilling inward and downward, much less loss of structure is caused than any attempt to approach from the distal surface. Nothing so weakens a lower bicuspid as free cutting on its distal aspect. Having covered, in this general way, free approach to the root-canals, I will now consider the question of treatment applicable to each of the class of cases above cited.

Where the pulp has been recently devitalized, the chief considerations are, after the removal of all remains of the dead pulp, to preserve the most absolute cleanliness, to avoid the infection of the canal by the germs always present in the mouth, and the avoidance of infection by instruments which are tainted. It hence follows that the fluids of the mouth should be excluded, and that either new or thoroughly disinfected instruments only should enter the canals. I am careful, in the removal of the pulp, to use new Swiss broaches, the temper of which I immediately draw to a gray colour and use, or, if not absolutely fresh, I pass them through the flame; but as this is liable to burn the finer ones, it is generally preferable to take a new broach. There being no infection, there is no reason against the immediate filling of the canal.

Concerning the question of trouble ensuing to the peridental membrane from the putrefaction of the contents of the canaliculi, I have taken little account of, except in the teeth of young children, where I sometimes dress the canal with a twenty-grains to the ounce solution of zinc chloride. In all cases, however, I finally dress the canal with a saturated solution of aristol with gaultheria.

In respect to class 2, there is no question of the necessity of approaching them with great caution, since, whether the tooth is without caries or has a cavity of decay, the greatest danger is of infecting the tissues of the apical region. This I believe is very frequently caused by injecting some portion of the contents of the canal through the foramen. This may be effected either by making compression by the use of large instruments in opening the cavity, or by inserting instruments within the chamber or canal previous to disinfection of their contents. My practice is to make a small opening into the chamber by drilling, or otherwise, and inserting a small crystal of potassium permanganate, allowing it to dissolve in the fluids there or adding a modicum of water if the canal is dry.

In respect to the use of permanganate, it is important, in the front teeth, to use a weak solution, or to employ formalin, for the reason that there is danger of some discolouration of the dentine by the oxide of manganese. This is more particularly liable to occur with young children. When a portion of the detritus of the pulp is removed, I carefully convey on a broach a weak solution of permanganate.

I then close the canals with a thread filled with the solution of aristol before named, seal the outer cavity, and await indications of the possible previous infection of the apical tissues. If in forty-eight hours these do not appear I proceed to fill the canals.

In respect to the third class, the subject is so complex that it is difficult in such an effort as this to go over the ground in detail, for the reason that the conditions are so various, in consequence of the varying impressibility of the tissues of different persons to infectious influences, and also probably because in different mouths the pathogenic character of the organisms vary in their virulence.

When there is a fistula and an open foramen, or where we can safely and surely make a small enlargement of the foramen, the case is reduced to simplicity, since a single irrigation of the fistulous tract with zinc chloride, five to ten grains to the ounce, or of ninety-five per cent. carbolic acid, will usually be sufficient to produce a cessation of the purulent discharge.

When, however, there is no fistula, the difficulty of disinfection is increased. My plan here is to expect a correction of the conditions by the slow admission of a disinfectant which in its nature is not irritating. For this purpose I loosely fill the canal and pulp chamber with lint saturated with the solution of aristol, and fill the outer cavity around a root filling instrument, of such size as will permit the effusions forming at the apical region to escape through the small opening left on the withdrawal of this broach.

The case is then repeatedly dressed in this manner, each time reducing the size of the broach-opening until at last its use may be avoided. Then I temporarily fill the canal tightly with a thread dipped in aristol as a tentative measure.

There is one class of cases of this kind where there is no effusion, but which will not tolerate closure. At each attempt irritation sets in, with threat of inflammatory conditions. I have found with these the greatest benefit to follow the use of a two-and-a-half-per cent. aqueous solution of formalin, with which the canals are dressed. It is important to avoid forcing formalin through the foramen, since it excites a degree of irritation scarcely explainable. Neuralgic soreness arises not attended by inflammatory conditions. This condition does not easily abate. Therefore I throw out this caution. In passing, I may state that in the treatment of apical disorders there has too often been exhibited the disposition to use active medication when patient administration of milder disenfectants would be more efficient. After the active disturbances have passed, I continue the disinfection with aristol in one of the essential oils.

Canal Filling.—Concerning the filling of the canals, I generally air-dry them, and coat the surfaces with chloropercha and insert hard cones of guttapercha. In some cases I employ oxychloride of zinc. In large roots I feel it important to mallet into the apex a cone of gold-foil to perfectly occlude the end of the canal. With reference to the buccal roots of upper molars and the mesial roots of the inferior molar when it is not feasible to enlarge them, I rely upon the instillation of chloropercha or oxychloride of zinc, but have to confess, in many cases, inability to either remove all the remains of the pulp or to secure perfect occlusion.

In conclusion, I would state that where there is reason to believe the canals have been filled when after-disturbance occurs, which does not at once yield to refrigeration and the application of iodine, I perform alveolotomy. The technique of this operation is to refrigerate the gum over the end of the root, puncture the gum, and drill directly into the apical region, making a small aperture. Before drilling, the gum-tissue at the puncture is dressed upward in order that the retraction of the gum will cover the drilled orifice.

The result of this operation usually immediately aborts inflammatory conditions by depletion, and also brings on irrigation of the apical tissues by the flow of blood. The result of alveolotomy where indicated is followed by salutary results.—*International.*

REMINISCENCES OF SIXTY-FOUR YEARS OF PRACTICE.

By Otis Avery, D.D.S., Honesdale, P.A.

In the year 1833 I received my certificate of qualification to practise dentistry from my preceptor, Dr. D. C. Ambler, of Barclay Street, New York. You will bear in mind that at that time there was not a dental school in all the world, nor any institution where dentistry was taught. Neither was there a journal devoted to the art (for it was called an art in that day), and the only mode available for improvement was by comparing notes among several dentists, which was a kind of close corporation, keeping our several views within the charmed circle.

While the demand produced the supply in a few years, at first we were obliged to make our own instruments, especially pluggers and excavators. Having furnished myself with what was then considered an ample outfit, composed, say, of a dozen of agate-handled pluggers and some four dozen mother-of-pearl handles with sockets for excavator-blades, all ferruled with gold and arranged in trays, they made a beautiful display ; and having made them myself I felt justly proud of them. I took them to the town where I had lived some three or four years, and confidently expected to receive as liberal a support as a dentist as I had as a watchmaker and silversmith. But nobody seemed to be in want of my services in that line. I was a member of a religious denomination, and I asked a member, with whom I was on intimate terms, to call and look at my instruments. After contemplating them a little time, I found he did not enthuse any and wondered what was the trouble. At last, with a sigh, he turned and said, "Brother Avery, do not you think you would be doing the public and yourself more good by throwing these things into the river and going back to your old trade?"

To say that I was astonished is putting it mildly. I saw at once that he took a view of the matter which I had never thought of; that there was a moral principle involved in the occupation of dentistry. The church then discountenanced personal adornment much more than it does at this day, and held that anything which tended to foster the pride of life was to be shunned, as from the evil one. I soon found that the matter had been discussed and settled, among those good men, that I was going straight to perdition, and that they must make an effort to prevent such a catastrophe ; for another member called to argue the question, and among other things he said that practising dentistry was going against and in the face of Providence. And also that it was not a respectable calling. I cited to him the fact that the best of men did not hesitate, when their eyesight failed, to supplement it with glasses, nor was it considered going against Providence for a man who had lost a limb to have an artificial substitute. And as for the respectability of the calling, I would try and make it so, so far as I was concerned, with much more in the same line. But anything I could say went for nothing. Our church in the town was but a charge belonging to a circuit, with no resident minister ; the preacher visiting us only once a week. But he, being an intelligent man, soon put a stop to any further action against me ; otherwise I do not know but they would have considered me a subject for discipline. Yet they were good men, and I thought, "let the righteous smite me," &c.

It stirred up, however, an opposition to me such as they little expected. I had been somewhat active in our social meetings, and there was a class that looked with delight upon what they considered my fall and repudiation by the church. They "always knew I was a scoundrel," and "were not surprised that I should show it when it was my interest to do so." All of which I let pass ; but when they ventured to charge me with crime, rather than be called to answer before a court, they were willing to acknowledge the charge malicious and false.

Finding I should get nothing to do in that neighbourhood, with such a feeling against me, I determined—was compelled—to find some one who knew what dentistry was, and I started on my travels. I went from town to town by such conveyance as offered or could be procured. On my arrival at a place I would send a boy out with my card, stating that I could be consulted and would be happy to attend upon any who should need my services as a dentist, either at the hotel or at their residences. Then came an anxious waiting. I would display my instruments so they could be seen, and sometimes there would be half-a-dozen young fellows in to stare at me and gaze at the instruments. I never was very self-asserting, and that fact may have had something to do with it. But they seldom spoke to me, and I had too much self-respect to make a personal application for their patronage ; though I maintained a sociable and friendly manner. Thus it was, day after day, in different towns and hamlets until I became heart-sick.

It seemed as though there was a conspiracy against me, for nobody wanted my services or seemed to know what dentistry was ; they seemed to think my instruments were simply to look at. But at one place where I stopped, when they were looking at and talking about them (they had found that I had made them), one of the company said, "I do not know what them tools are for, but this I do know, that a man who could make them knows how to use them." He was the first to grasp my motive in displaying them. With half a mind to give up the struggle and turn back, I felt as a man must feel who had expended all that he had and could borrow on a cargo of goods which nobody wanted, or would take as a gift. I was convinced of the fact that some had looked at the matter as a show ; as, when I stopped at one place, which was nothing more than a hamlet, I found a crowd with an air of expectancy standing around, and as I stepped into the tavern the landlord said, "Your things have not come yet." It appeared that some wag had told them there was a show coming and to look out for it. As soon as we could feed the horse we drove to the next town, leaving them in expectation of a harlequin with his Punch and Judy. At another time I had employed a man to take me from a town, and after we had started he said to me, in a confidential tone, "How's business?" "Not much," I answered. "Oh, now," he replied, "you needn't say that, for you folks always pretend you have made nothing. I know one fellow who made a big swag about six months ago." "How did he make it?" I asked. "Why with his roulette," said he. I replied, "I am not in that business." "What business are you in?" he asked. "Dentistry," said I. He gave a snort of disgust, as much as to say, "I thought you were a gambler, but you are nothing but a dentist."

I had started out full of hope and expectation, but here I was with my money nearly all spent, and from an optimist I had become an inveterate pessimist, disgusted with myself and my surroundings. In this state I arrived at a town where I had been known when a boy, though I had never lived there, and sent out my cards, and was debating whether I should give up the struggle and take the next stage for home when there came a message from a wealthy Irish family in the neighbourhood, requesting me to call at their house with my instruments. I found they were well versed in dentistry of the old style, but when the lady found that the base plate was made of gold, with porcelain teeth soldered on it, instead of an ivory plate with the teeth riveted to it, she immediately ordered an upper set. The younger branch of the family consisted of a son and his wife. Their teeth had been kept well filled. The wife, I found, was the prime mover in calling me to visit them. She insisted on her husband having his teeth cleaned, and tried in every way to find something for me to do so as to make a bill. Now it has always been a query with me whether it was not sheer compassion which induced her to have me call at their house; for, by some means, they had heard of my being in other places and how I had been received. At any rate, I have always since liked the Irish and kept for them a warm place in my heart, for they were the first to offer me any encouragement and kindly advice. I had hardly taken an impression before it was noised about town that Mrs. Penderghast was going to have a false set of teeth put in her mouth. While I was much elated, I tried to maintain my equanimity as though the ordering of a 50 dollar set of teeth was an every-day occurrence. Yet the sky looked brighter, the birds sang sweeter, and my feet took a more elastic spring. Hope returned and I decided to go on to Utica, where there was only a dentist and a half, for one of them divided his time between shaving his customers and extracting their teeth, with phlebotomy incidentally added. I found whom I intended to call on, and, fortunately for me, they were in want of my services, and they advised their friends to employ me for what dentistry they needed, so that I was amply paid for my visit there.

They urged me to open an office in the city, and I went so far as to look for suitable rooms, to be ready, if, on consulting my wife, we should conclude to take them. She had been kept advised of the condition of things, which had resulted in no money till I got to Utica, except the little produced by extracting a few teeth, and that generally caused an altercation, because I charged a shilling, whereas the doctors would charge only sixpence for extracting. She said my mistake was in going north instead of south; that if I had gone among the *bandits* of the Beech Woods I must certainly have succeeded. The terms she used needs some explanation. Soon after we had moved to New Berlin we were at a social evening party, where a lady told of a visit of a friend who had travelled all the way from Philadelphia with their own conveyance, and their route necessitated their travelling through the Beech Woods of Pennsylvania, which was filled with all sorts of wild beasts, such as wolves, bears, and other ferocious animals, with men more savage and dangerous still, who made those woods their haunts. They were in constant fear for their lives, as they often saw men with guns and axes prowling around in the bushes; that they actually saw where one murder had been committed, marked by a pile of stones by the side of the road, with a lot of other trash of the same kind After she had finished, the company sat spell-bound with horror and almost breathless to think there was such an awful place in this country. After a little my wife said, " Well, I was born and brought up in the Beech Woods and educated in the Beech Woods Academy, at Bethany, and never in all my life heard such stuff as that about my native county." The effect was electrical. If a native of the Fiji Islands had dropped down among them they would hardly have been more surprised, for here was a denzien of that terrible place sitting in their midst clothed and in her right mind. The lady, however, was not disposed to give it all up, so, turning to me, said there certainly was a murder committed, as she saw the pile of stones which marked the place. "Yes," I replied, "but both the murderer and his victim belonged in the State of New York, and all that the people of the Beech Woods had to do in the matter was to hang the murderer in accordance with the law."

Coming back to Wayne County as a dentist to my friends in Bethany (which still was the county seat), who knew me as having been the first to establish a watchmaking and silversmith shop in the county, they received me cordially, showing no intimation that they thought I had done anything reprehensible by becoming a dentist. Thus was my itinerary established, reaching from this point north to the Mohawk Valley, more than a hundred miles in length, and taking in most of the towns within 20 miles on each side. Except at Binghamton, there was not, in all that region, a resident dentist. I soon found it necessary to drive my own conveyance to economise time, for as soon as I had finished the operations required and taken such impressions as offered in one town, I started for the next, whether it was in the daytime or at night. In fact, most of my travelling was at night. I would send out my cards, wait one day, and, if nothing offered, after supper would start for the next place. Whenever the amount of business in a town fell to less than five dollars a day I started on my travels. By such means those wanting anything done were sure to be on hand. Sometimes there would be a general scramble for chances. All mechanical work was done at home, so this and the manufacture of teeth took up all my time.

In that day there were men who had been eminent preachers in their prime, but were stranded—silenced as much as if by decree of Conference or Synod because of their inability to pronounce many words of our language, made up as it is so largely of dental sounds. When they began to preach again, to their own delight and the edification of the public, my conscientious brethren admitted that dentistry was not altogether bad ; that false teeth might be a help in speaking, but that was all ; they were only good for that, but of no service in eating. I had put in a set of teeth for a physician of more than local repute, who, when bantered by a lady for being so proud as to have artificial teeth, which could be of no use to eat with, said to her, "Put your finger in my mouth and see whether they are all for looks." She did not want to repeat the experiment, certainly not until her finger healed. These things seem very trivial now, but at that time it was as much of a curiosity as the telephone was on its first introduction.—*International.*

PORCELAIN INLAYS.

By N. S. Jenkins, D.D.S., Dresden.

When porcelain and glass fillings were introduced it seemed as if the disideratum was approximately reached. Here were materials which represented the colour of the natural teeth with reasonable fidelity, and which were good non-conductors. Porcelain could be ground to fit a cavity, or melted in a platinum impression. Many good results were obtained with both these materials, but, in general, they were found to be very inconstant. It tried the skill and patience of the ablest and most enduring men to grind porcelain inlays to a perfect fit, and when either porcelain or glass was melted it was liable to be disappointing in density or colour, and accurate contouring seemed to be only a happy accident. Moreover, one could not depend upon the endurance of the colour, and a black line frequently appeared at the junction of filling and enamel.

"I know not what others think, but as for me," I was fascinated with the possibility of glass fillings. I strugged with that seductive and treacherous substance in season and out of season, until I was often forced to exclaim, in the words of Hanns Breitmann, "der Schnitzerl sei verdammt for teaching me dos dings." But at last I realized that a new material must be evolved, one which combined the good qualities of both porcelain and glass, and to its evolution my laboratory has been devoted for the past three years. The problem I set myself was to make a low melting porcelain, which should retain its colour, could be melted to a perfect fusion in a gold inlay, and which would have a clean edge so hard that it would not fracture in setting, nor in enduring the strain of mastication. This result I have at last attained.

Our most successful experiments in pure glass were made by my partner, Dr. O'Brian. Among other things, he discovered that, after a glass filling had been melted, its surface could be immensely improved by placing upon it a thin plate of clear glass and melting once more. By this means a surface was obtained so smooth, and so nearly representing the enamel, that the most beautiful operations could be made. Only, as in all glass fillings, contours were not certain, overflow easily occurred, and perfect manipulation required much care, experience and skill. Besides which, the porosity of the underlying glass made permanency of colour uncertain. This method is, however, an extremely valuable one. Every now and then a case occurs where the conditions require just such a surface as can be obtained only in this manner.

In making an inlay filling, the first step is to properly prepare the cavity. There must be no undercuts, or at least only in one direction, and the edges must be clearly defined. A perfect impression must be obtained, employing gold foil for the purpose. Platinum, however thin, and however carefully used, is too intractable for accurate work. For my method, gold foil No. 30 is, in almost all instances, sufficiently thick. For very large and complicated cavities, No. 40 may be taken. The piece of foil must be generously large, and carried, with cotton or spunk, first to the deepest part of the cavity, leaving the edges free ; for, of course, the foil will not stretch, but tear, if it is confined to any exterior point as it is being pressed home. Then another and somewhat larger piece is packed into the cavity, and when this is quite full, then the edges are made, and pressed or burnished until they are perfectly smooth. If there is too much overlapping margin, it can be trimmed away with a sharp lancet. The cotton or spunk must thereupon he removed, when, with a sharp-pointed excavator, inserted at the most favourable place within the cavity, the gold can be loosened, and gradually worked out in unimpaired condition. The impression thus made is laid upon a creamy bed of powdered asbestos and water, at the bottom of a small, long handled, platinum or nickel tray, which is gently tapped until the gold has sufficiently imbedded itself in the asbestos. The tray is now held over the blow-pipe, and the asbestos completely dried, a condition usually indicated by a loosening from the bottom of the tray. The contents of the tray being sufficiently cooled, the powdered porcelain mixed with water—distilled water is preferable—is placed in the impression, care being taken to have it come exactly to the edges, but not to overflow at any point. It is then built up somewhat higher in the middle, or on those parts which it is desired to contour, an excess of material being necessary to compensate for the consolidation attendant upon melting. After some experience it is possible to get, in most instances, the exact fulness required in one melting ; but there is no objection to adding more porcelain and remelting, except loss of time. When the inlay has been properly packed, a cover, which has an opening through which the process can be observed, is put upon the tray, and the whole placed in an asbestos lined muffle, open on one side, and with a round hole in the bottom. Through this hole a gentle heat from the blow-pipe is turned on, the moisture in the powdered porcelain thus being slowly evaporated, not boiled out. Then the finger is placed upon the spring of the blow-pipe, and under the action of the bellows the heat is very gradually increased until the mass is completely melted. The finished inlay is then removed from its asbestos bed, and the corners of the gold foil gently turned backward until it comes away in a complete piece. Any particles of gold which may adhere to the inlay can be easily removed with the point of an excavator. After trying it in the cavity, to make sure that the fit is perfect, the inlay is usually grooved on the inner surface, generally with a small diamond disc. Slight undercuts are made in the cavity, everything is perfectly dried, and the inlay is set with some reliable phosphate of zinc mixed to a thick cream. A little of the phosphate should be smeared within the cavity, as well as upon the bottom of the inlay, the latter being carried at once gently into place. In an approximal cavity I use a piece of tape to bring the filling into position, and at the same time remove the surplus phosphate. In other cavities any convenient method may be employed to remove the surplus, but in all cases it is best to exert the final pressure with a bit of wood, except where it happens as sometimes in a labial cavity, that the thumb nail can be easily used. With firm, but gentle pressure, the inlay is held in place for a few minutes, when it can be left alone, with the rubber dam in position, until the phosphate is completely hardened. In many cases it is safe to cover with varnish, dry with hot air, and remove the dam after a few minutes, but this detail is a matter of judgment. At a subsequent sitting, any slight surplus of overlying phosphate is carefully removed with a fine pointed excavator, when it will be found that the line between the inlay and the edge of the cavity is no wider than such cracks as one often finds in the enamel.

The beauty of this work is only equalled by its practicability. Accurate contours can be made. Of course it is not applicable to all approximal cavities, but in places where its use is indicated, there is no doubt about the condition of the cervical margin, that weak point in obscure cavities, and especially where the pulp is nearly exposed, if intelligently and accurately made, it will stand even better than gold, since it is not supported by, but assists to support thin and frail edges. The operation, although requiring considerable time, is far easier for the patient to bear than the packing of gold. The time of the patient may be saved by taking the impression at one sitting, and making the filling in the patient's absence. To be sure, by carefully following the directions, any ordinary dentist can, in many instances, make in this manner a beautiful and enduring operation, but it is by no means a cheap and easy method. Its proper employment requires the highest qualities of skill, judgment and taste. Only experience will show how the obstacles peculiar to this process are to be overcome, but when this method is once mastered, it gives to the competent dentist a range of operations so wide as to greatly increase his interest in his work as well as his usefulness to his patients, who immensely appreciate the advantages of this treatment.

Time fails to enlarge upon the use of this porcelain in pivot teeth, crown and bridge work. With it, all the visible part of a broken down molar can usually be restored, with a platinum ring about the neck of the tooth. Malformed roots can be securely crowned, with or without a ring, according to the case, and where the tooth must be thin, because of the closeness of the bite, a far stronger tooth can be made with this material than with a soldered gold backing. When a tooth thus united to a platinum pivot is put under the hammer, it will be found that the tooth will fracture before this porcelain. One great advantage of this new material is found in being able to solder rings, pivots and pins of platinum with gold, and then melt the porcelain without fearing that the gold will melt or flow.—*Dental Register.*

PUTTING ON METALLIC BACKINGS FOR VULCANITE WORK WITHOUT SOLDERING.

Dr. Kissell makes use of this plan in partial cases where patients are liable to break off the porcelain, leaving the pins in the plate. Any metal of gauge 27 or 28 either gold, platinum, or Columbian silver (he uses the latter exclusively), may be used. After the plate tooth is ground in position, a piece of the metal the width of the tooth and one-half to three-quarters of an inch in length is first annealed, then holes cut in it to accommodate the pins of the tooth. The metal is slipped over the pins, and they are bent to form an ×. The tooth, with the metal in place, is then put back on the model, which is waxed up as usual. When the case is packed the rubber will surround the bent pins and the metal. The advantage of the backing is that it gives strength to the tooth, and it also allows the lower tooth to strike only against the metal instead of the thin porcelain. Rubber will vulcanize very well with Columbian silver, and it will hardly tarnish in the mouth. This process requires but a few minutes' work, and it removes the danger of checking the tooth or discolouring it by the heat required for soldering, nor is it necessary to have the case invested.—*Cosmos.*

TO MAKE A PERFECT CAST.

Marble dust and glycerine—about 4 ozs. glycerine to a quart of marble dust—makes a beautiful cast. I have been using it for a long time and like it better than anything else I have ever tried ; in fact, can find no fault with it.—Chas. P. Grout, *Off. and Lab.*

TO TOUGHEN PLASTER CASTS.

Plaster casts may be made so tough that they will bear the driving of a nail into them without cracking by immersing them in a hot solution of glue for a sufficient time to permit its permeating the entire mass.—*Scientific American.*

A QUICKLY MADE MATRIX FOR CEMENT, AMALGAM AND GUTTAPERCHA FILLING.

By Theodore F. Chupein.

Cut a piece of thin German silver plate, such as is furnished for matrices, about one-eighth of an inch wide, or narrower, and about half an inch larger than is necessary to encircle the bicuspid or molar tooth you may be about to fill. The rubber dam having been applied, the cavity prepared, and all things ready for the insertion of the filling, pass the strip of metal around the tooth, seizing the two ends with flat nose pliers, and draw it up close to the tooth, in the same way as you would do if you were making a band for regulating purposes. When closely fitted remove it and heat the ends and while hot place on one end a film of hard or adhesive wax. Now replace the band on the tooth, and by heating the noses of the flat pliers, the ends are again seized. The heat of the pliers melts the hard wax which was placed on the ends of the band matrix. The matrix is held with the pliers until the wax is thoroughly cold. When removed the matrix hugs the tooth closely and the wax is sufficiently tenacious to hold it in place until any of the above-named plastic fillings may be inserted.—*Dental Office and Laboratory.*

GOLD PLATING BY DIPPING.

The following formula, which appears in the *Zeit. Angew. Mikrosk.*, has been recommended: Crystallized pyro-phosphate of sodium, 80 gm.; hydrocyanic acid (12 per cent.) 8 gm.; and crystallized gold chloride, 2 gm., are dissolved successively in one litre of distilled water, and heated to boiling. The object to be plated is well cleansed, attached to a copper wire, and immersed in the boiling fluid.—*Amer. Druggist.*

HOW TO PREPARE A CAVITY IN AN ARTIFICIAL TOOTH.

By S. A. Whedon, D.D.S.

Take a small size corundum wheel and grind a cavity the size and shape you want it, then take a small discarded fissure drill and harden as hard as possible, and sharpen to a blade point by grinding on two sides, moisten cavity with campho-phenique, and by frequently sharpening the drill on an oil stone you can drill retaining pits any size and depth you wish in a very few minutes, without any danger of fracturing the tooth.—*Dental Review.*

SUPERNUMERARY TOOTH IN THE NOSE.

Dr. G. Chincini observed, in Professor de Rossi's clinic, a woman, twenty-three years of age, who complained of nasal symptoms, with fœtid discharge, crusts, etc. By means of a forceps there was removed from the nasal cavity not a piece of bone, as was thought at first, but a molar tooth with two roots blackened from gangrene. The author believes that this tooth was developed in the nose, its germ being present there before the palatine fissure was closed. The teeth in the superior maxillary bone had all the characteristics of permanent teeth.—*Universal Med. Jour.* from *Arch. ital. de Otol, etc.*

LOW FUSIBLE METAL.

Dr. R. Mathew makes a low fusible metal which melts below the boiling point of water, and is very hard. It is composed of forty-eight parts of bismuth, thirteen of cadmium, and nineteen of tin. It melts at so low a temperature that it can be packed with the fingers. A common plastic impression can be taken to the laboratory and poured at once without waiting to dry—can even be poured in water, for counter-dies use common modelling compounds. Soften and place it in a ladle, and place the die on it and drive it with a plunger and hammer ; then place the plate on the model and swedge it in the counter-die after it gets hard. Do this three or four times, but this will not draw it close enough : now use shot in the latter part of the process.—*Cosmos.*

A PRACTICAL HINT.

By Burt Abell, Albion, Mich.

Lay a thin piece of plain paper over roof of patient's mouth, and by digital pressure ascertain where mouth is hard, marking outline with a pencil. Remove and cut to pencil line, and you have an exact pattern of tin relief required on the model.—*Ohio Dental Journal.*

Reviews.

"Some Methods and Appliances in Operative and Mechanical Dentistry," by R. P. Lennox, *illustrated*. London: C. Ash & Sons.

This useful little book consists, for the most part, of descriptions of those mechanical methods which Mr. Lennox has previously shown and demonstrated at the various meetings of the British Dental Association. More especially do we refer to the different uses to which he puts fusible alloy and his method of making crowns. Of bridge work Mr. Lennox says: "I am satisfied that I can do better for my patients with a plate than with the least ambitious piece of bridgework"; but at the same time he seems to retain an open mind and to be ripe for conversion, if those who advocate this method will but give reliable statistics showing that bridges are of *permanent* value. Such statistics will doubtless be forthcoming in time, and are really wanted. Mr. Lennox's experience is apparently confined to a couple of cases in which the four front teeth were supported on two lateral roots, the result being failure. "Here," he says, "if anywhere, one would have said *most* was to be hoped from a bridge." If for "most" we substitute "least" then we agree with him. The lateral roots are the least able to support bridges, they are small, short and weak. Moreover, the front teeth, being placed in the arc of a circle, there is a lateral strain which would be wholly absent in a bridge extending in a straight line from a bicuspid to a molar. In a review one can scarcely discuss the question, but we cannot agree that Mr. Lennox's statement of the case is at all complete. This book, however, contains many suggestions of a practical nature apart from the questions we have already alluded to. Some of these are of a debateable nature. For instance in advocating the use of the Pearsall sand moulding flask he finds one zinc die sufficient. Apart from the fact that we disagree with this we fail to see what is the objection to taking more than one zinc, if cores are needed we can understand there may be, but in an ordinary case it is very little more trouble taking the extra moulds; one melting does for the lot; all are not usually of equal merit and the best can be selected; and time is saved in not having to make the lead and tin counters to the same zinc. With regard to the position of swivels for springs, Mr. Lennox says :—"The bolts in the upper should go vertically over those in the lower, or rather just the least bit backward of that position." This we believe agrees with what is commonly taught; but if a spring be taken in the fingers and bent, so that one arm is longer than the other, it will be found that it is the shorter arm which tends to straighten, *i.e.*, that end moves backward. Now if the upper swivel is further back than the lower, the spring would tend to straighten by moving the upper plate forwards, this, however, it cannot do, because the upper plate is the fixed point in an edentulous case, being kept in place by suction. Hence the force is transmitted backwards along the spring round its curve and tends to push the lower plate forwards, in other words, that is actually done which springs are intended to prevent in an edentulous mouth (if the lower front teeth are standing the result is perfect, since the teeth antagonise the forward thrust). If the bolt of the lower swivel is posterior to the upper, then the spring tends to straighten by pulling back the lower fixed end. Hence, in our opinion, the greater the tendency of the lower plate to move forwards, the further back should the lower swivel be.

We are glad to notice Mr. Lennox condemns the practice of destroying the models of a case by vulcanizing on them. The convenience of having models to adjust the bite, or finished case, is so great that plates should always be vulcanized on duplicated models. The author's plan for duplicating the upper model by means of a fusible alloy base plate is ingenious and highly practical, but we do not understand how he proceeds in a lower case, since he usually makes his lower base plate in composition and does not vulcanize on a model or its duplicate, or, at least, so we gather.

The author will perhaps understand all we have said is by way of discussion of some of the numberless interesting points he raises, and not by way of criticism of his book ; and our readers will doubtless appreciate the fact that a book which has lured us outside the limits of an ordinay review is one well worthy of careful perusal.

"A SYSTEM OF DENTAL SURGERY," by the late Sir JOHN TOMES, F.R.S. Fourth Edition, revised and enlarged by CHARLES S. TOMES, M.A., F.R.S., with 269 illustrations. London: J. & A. Churchill, 1897.

In the preface to this, the fourth edition, the editor tells us that he has received from friends most opposite advice: some have suggested that the whole of that which relates to mere manipulative detail should be left out, and others that it should be expanded. "Whilst fully recognising the complete impossibility of teaching manipulative detail by words, no less the impracticability of dealing with matters in a chapter, when each of them require an ample work for their description, I have thought it better to retain such points of manipulative detail as may be thought to in some measure involve or illustrate general principles, and not attempt to do more." He says: "It has been my endeavour . . . . to keep intact the initial character of the book." The term "mere manipulative detail" as applied to the end all and be all of dental work and science is not a happy one, but otherwise it is hardly in our province to question the wisdom of Mr. Tomes's decision, though we may perhaps be allowed to express regret that one so well qualified to write an exhaustive treatise on the scientific side of dental surgery has not seen fit to do so. The book, therefore, retains for the most part its old characteristics. It is at once a marvellous collection of facts, details and theories, reminding us of the extensive knowledge of the editor; and at the same time a disappointment, in that the story seems always to be broken at the most interesting point. Dogmatism is a parasite which cramps the mind, smothering its growth, and we are glad, whether we look on it as a practitioner's or as a student's book, that this finds no place therein; but if a writer is not dogmatic he must, to convey a full account of existing knowledge, state the case fully and from every side, this, in many instances, the book fails to do. It is not so much that antagonistic views are not mentioned, but that so little space seems available for their discussion that we cannot imagine that a student, studying the subject for the first time, could form an intelligent opinion as to the relative value of these views. Brevity, indeed, seems to have been so essential that, in some instances, the editor's own views are so shortly stated that they are by no means clear. Thus, for instance, on page 164, we read: "It must be remembered that this bending, and in fact all the phenomena of open bite, arise whilst the jaw is growing rapidly, elongating backwards. May it not be that this backward elongation takes place whilst the child is a mouth-breather, and the symphysis pulled down by its depressor muscles, the original growth has taken place in that form, rather than that already formed bone has been bent?" We fail altogether to understand what this means. Opening the mouth does not alter the shape of the jaw, and there is no reason that we know of, or are told, why a jaw should grow deformed when it is in one position rather than when it is in another. Moreover, what is "that form." Is it a bent jaw? If so, it is suggested the cause comes after the effect. Is it a depressed lower jaw of normal shape? then there is nothing pathological about it, and it is not the condition understood by the term "open-bite." Another defect in the book for the use of students, qualified or unqualified, is the absence of headlines or divisions in the text. The index being absolutely inefficient, it is like looking for a needle in a bundle of hay to try and find any special matter, for instance, we look in vain for "open-bite" in the index, and in the text at last find it hidden in a chapter of 72 pages, headed "*Methods* employed for the regulation of teeth." The paragraphs of which are as like as parched peas, save that in some instances—by no means in all—the first few words of these begining a new subject are printed in obscure italics. There is no index to the illustrations.

A new and valuable chapter has been added on Bacteriology of the Mouth; also many new illustrations, mostly microphotographs and the matter has been brought thoroughly up to date. And if we have dwelt somewhat at length on what appear to us to be defects, it is because we regret that these perhaps minor thing should mar a work unique in character and wealth of matter.

CORRESPONDENCE.

[We do not hold ourselves responsible in any way for the opinions expressed by our correspondents.]

TO THE EDITOR OF THE "DENTAL RECORD."

900, SPRUCE STREET, PHILADELPHIA, PA.
June 26th, 1897.

ESTEEMED FRIEND,—I note in the June number of the *Record* an error, evidently typographical, that in the interests of correct history should be corrected. In reviewing Dr Essig's recent work *The American Text-Book of Prosthetic Dentistry*, referring to his history of the introduction of porcelain teeth into the United States, "A. A. Planter" should be A. A. Plantou. It is not claimed for Plantou that he was at all concerned in adapting porcelain to dental use. He was one of a large number of Frenchmen, who, owing to political complications in his own land, emigrated to this, and settled in Philadelphia in 1817. He brought with him a number of the old French teeth, spoken of by his contemporaries as marvellously exact imitations of the natural organs. I have a few of those identical teeth. We look at them very differently now than did our brethren of eighty years ago. Rude as they were, they excited a keen interest, they stimulated the inventive ingenuity of able men, whose united labours, after eighty years, have produced the wonderfully life-like artificial teeth we use to-day. His bringing over perhaps the best France had then produced started a new industry in the United States.

I fully agree with you, it is to be regretted that we have as yet no reliable history of the introduction of porcelain into dental practice. I am impressed that the material from which to write it is on your side, and you ought also to have the men. Lemaitre's work, the earlier ones of De Chemant, Audibran, Chambly and Joseph, Fonzi, C. F. Maury, and others, some of whom, I presume, from extracts I have occasionally seen, are of a controversial character, would no doubt throw light upon the subject, and they ought to be found in some of your old libraries. Other information concerning it may be found in the proceedings of some of the scientific societies of England or France.

The later history of porcelain artificial teeth is not difficult to trace; what we want is a history prior to their becoming commercial, say prior to 1820.

Yours respectfully,

William H. Trueman.

To Polish Aluminium.—Grey or unsightly aluminium may be restored to its white color by washing with a mixture of 30 gm. of borax, dissolved in 1,000 gm. of water, with a few drops of ammonia added.—*Amer. Druggist.*

THE DENTAL RECORD.

VOL. XVII. SEPTEMBER 1st, 1897. No. 9.

Original Communications.

ELECTRO-CATAPHORESIS IN DENTAL SURGERY.

USING THE DENTAL MANUFACTURING COMPANY'S PORTABLE DRY CELL APPARATUS.

With some suggestions as to the mode of application (more particularly for those practitioners who do not possess electrical knowledge.)

Compiled by HERBERT B. EZARD, L.D.S. Edinburgh.

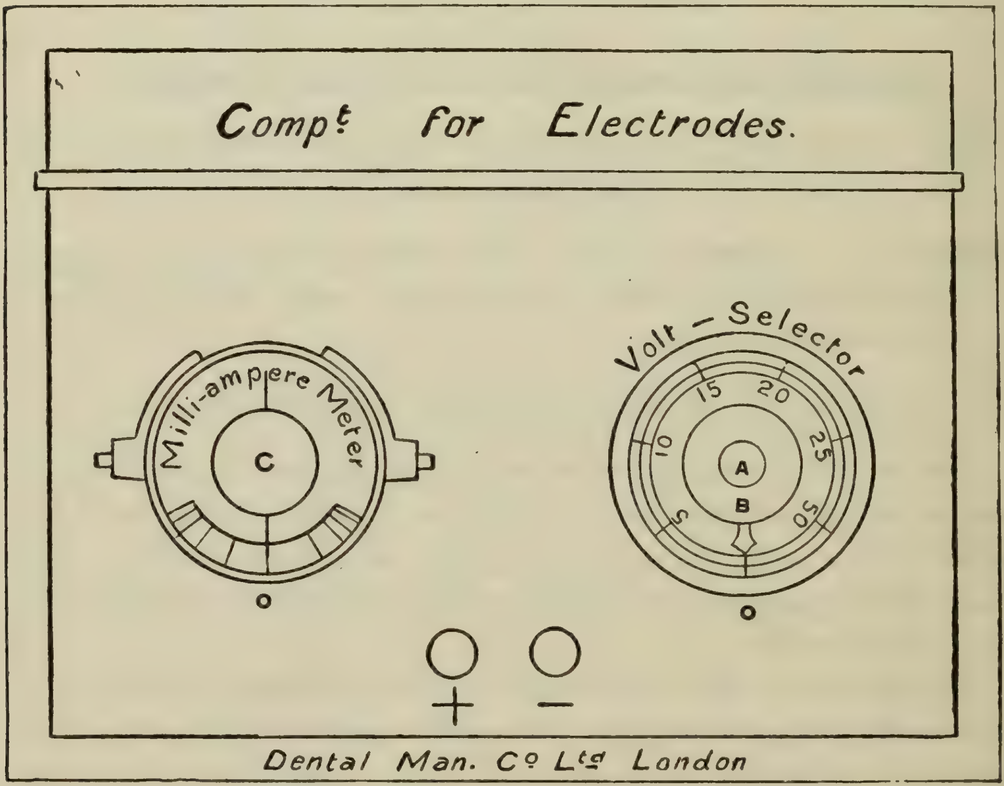
IN the advancing conservatism of the present day teaching of dental surgery a recourse to forceps as a mode of treatment for dental lesions is becoming to be regarded as a token of defeat—that is, to the practitioner who considers that his mission is salvation and not extermination.

By means of this process of electrical injection of drugs, a putrescent pulp, a putrid root, the most sensitive dentine, nay, even pyorrhea alveolaris, may be faced with equanimity and even pleasure.

The word "electric" seems to convey to the uninitiated a feeling of hopelessness and confusion which is perfectly unwarranted, and in this short paper an endeavour will be made to explain how easy it is to use electro-cataphoresis with this apparatus in a purely mechanical manner, without the slightest knowledge of electricity being necessary.

First let this fact become firmly implanted in his mind—" Positive (+) currents have the power of carrying along their circuit metallic salts." It may be asked what is the positive current? The answer is simple. Saturate a strip of white blotting paper with a solution of iodide of potassium—lay across the terminals marked (+) and (−) on the above diagram—turn the knob marked A to 10 and the terminal which turns the paper *brown* is the positive current and must go to the mouth. The other wire goes to the sponge electrode which is saturated with a 20 per cent. solution of common salt and water, the addition of a little rose water being pleasant.

The sponge electrode is, for convenience, placed in the hand, but any other portion of the body would do as well—the neck for instance. The hand is first prepared by having the centre of the palm rubbed with æthereal solution of soap and then sponged with distilled water. The sponge surface of the electrode is placed in the centre of the palm and the fingers are "fisted" over the rubber backing, the patient being instructed to hold it tight, but not tight enough to cause cramping. In prolonged operations the edge of the sponge should be felt occasionally (without being removed) and if warmth or dryness be felt, a little more salt solution should be squirted into the hand from a syringe—a note of warning here, see that the hand holding the sponge is ringless, and that it rests on a sheet of rubber. (A "cash-lifter" on a napkin is a good tip.)



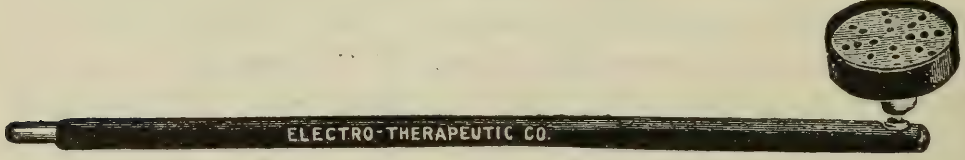
Now for the wire going to the mouth. What does the operator desire to treat? He has under his control:—(1). The treatment of exposed pulps; *a* with the intention of capping; *b* with the intention of extirpating (for crowning); *c* with the intention of mummifying, embalming and leaving in situ; (2) The treatment of sensitive dentine in caries and erosion; (3) Bleaching.

Before proceeding to attempt a treatment for the foregoing, the operator must bear in mind that the tooth to be treated must be entirely isolated by rubber-dam (insulated) from the surrounding teeth and tissues, to prevent leaking of current and consequently pain to the patient. Any metallic filling in the tooth must be varnished with guttapercha solution or with a thick solution of shellac in spirit and thoroughly dried. If the dam cannot be tied, that is if a clamp has to be used, the clamp must be thoroughly coated with one of the above solutions (or Filmogen) and dried by hot air before being applied to the tooth. There must be no leakage of moisture through the dam and no marginal "weeping." Having taken these precautions the operator is ready to attend to the tooth and treat:—

1st. The pulp with a recent carious exposure, generally aching. After eighteen months' experiment the writer has found the following treatments practical and successful. Dry the cavity thoroughly with hot air, prepare a fresh solution of cocaine hydrochlorate, 30 per cent. in Meditrina, cut a piece of fibre lint of sufficient size to well cover the exposure, saturate with the solution, dip into dry iodoform and place over the exposure, connect the positive (+) wire with the platinum wire electrode, the point of which has been bent so as to fit the cavity and lie closely in contact with the fibre lint. See that the needle C (in diagram on page 4) points to O, and also the indicator B of same diagram at O. Place the platinum needle on the fibre lint without pressure, and move the knob A very slowly, watching the patient's lower eyelids for contraction, this being a sign that enough current is applied for the moment. Wait five seconds, and turn the indicator on a little further, taking the same precautions. Generally speaking, after five minutes of this constant alternate increase and stoppage the

knob A may be immediately turned back to zero, and the platinum point and fibre lint removed from the cavity, which may then be freely excavated, even across the exposure. The exposure is next covered with "Formagen" on a celluloid cap and the cavity filled in the ordinary way with cement. "Formagen" is the latest treatment, but carbolised resin may be used.

2nd. Exposed pulps to be extirpated, for crowning, &c. The same precaution as to isolation must be taken, the 30 per cent. cocaine hydrochlorate in Meditrina is used. A different electrode is necessary—the rubber cupped.



A section of a small wool roll is saturated with the cocaine solution and packed into the cavity or over the surface if there is no cavity, *i.e.*, if the crown is gone.

The rubber cup is placed over the tooth or root with the platinum plate touching the wool pellet and the current turned on.

The quantity of current, and the time necessary for devitalizing, vary largely in individual cases. As much current should be used as can be borne with only a slight feeling to the patient of heat or pressure, and the time in the writer's experience varies from 14 minutes to 47 minutes.

3rd. Putrescent pulps to be mummyfied, embalmed, and left *in situ*, instead of the old treatment of removal and root filling.*

Teeth and roots which have for years been in a putrescent condition have by the electric injection of guaiacol cum sulphuric acid been either filled or crowned, and without any after inflammation. The method of treatment is the same as in the second case, with the exceptions that the formula Guaiacol, ʒj; Acid. Sulph., ♏j; Aq. dest, ♏ ♏ij, is used on the wool pellet and that a greater pressure of current can be used.

The writer finds that a current of 17 for half an hour will cause the guaiacol to penetrate to the apex of any root. The tooth is then dried with hot air thoroughly—indeed, so thoroughly that slight pain is caused in the roots by the heat. Some Ditcham's Germicide (which contains ossifying properties) is next forced into the canal or canals and the whole covered with cement. This experiment is well worth trying—but, of course, one year's success is scarcely sufficient time to prove a result.

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*The writer's success with this treatment in his own practice has led him to write this paper in the hope that others will experiment and give the profession the benefit of their results.

It is as well to make a note of the fact that in these three treatments success is more than doubtful if periostitis be present and ignored.

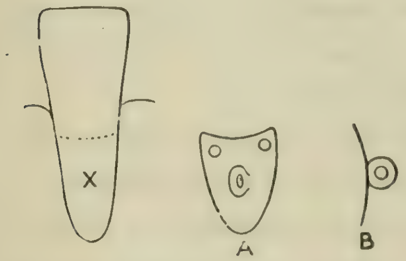
Treatment of Sensitive Dentine.

The treatment of sensitive dentine in caries is the same as that of the first case, minus the iodoform. The knob A must be turned with perfect evenness and very slowly, and the time required is about 15 minutes on an average.

Erosion.

Special electrodes have to be made for nearly every case. A piece of No. 3 soft platinum is cut to the shape of the eroded surface—a small ring is soldered to the middle of one side—and a hole punched in each of the upper corners.

Enlarged Diagram.



X Eroded Surface.

A Platinum Plate with Ring and Holes.

B Ditto showing Ring.

A piece of fibre lint is cut the size of the plate and placed *dry* on the eroded surface. Silk threads are passed through the corner holes and the plate is tied over the fibre lint. The needle electrode is bent into a hook and passed through the metal loop.

With a pipette drop a minim of 30 per cent. cocaine hydrochlorate in meditrina on the fibre lint. Turn the knob A slowly and gently as much as the patient can bear with equanimity and keep increasing for fully half an hour—placing a fresh drop of the solution on the fibre lint every few minutes.

Half an hour is generally sufficient, but no set time can be given, as sensitiveness and conductivity are variable items. Let it suffice to say, that in all sensitive cases the result has been fully attained, when the patient can lay down the sponge electrode from the hand, without being conscious of any sensation in the tooth, even although the knob A is at its highest.

BLEACHING.

To bleach a discoloured tooth proceed in the following manner:—Remove all fillings and carious matter. Pick out a tooth (on a "string of shades") of the colour to which you wish to bleach (*i.e.*, the colour of the adjacent teeth). Isolate the tooth with dam. If the pulp is *in situ*, varnish the dentine over it with guttapercha solution, and dry it. If the canals are open, they must be filled with guttapercha, or some *non-conducting* cement. Dry the tooth thoroughly with hot air. Saturate it with a 5 per cent. solution of chloride of sodium. Into the cavity pack a pellet of wool saturated with peroxide of hydrogen. Place the point of the platinum needle electrode in this pellet, and the sponge electrode in the hand as before, and gradually turn on as much current as the patient can stand, and continue until the tooth has become the desired shade. One thing to be noticed is that the pellet in the tooth does not become *dry*. This can be ascertained by watching the needle marked C on diagram of apparatus, page 4. If it shows a tendency to go back towards zero the pellet must be moistened with more $H_2 O_2$ from a pipette.

In conclusion it is hoped that this simple *brochure* on the working facts of "Electro-Cataphoresis in Dental Surgery" may stimulate a more general use, and in that manner promote further research into this most fascinating subject, as it cannot be doubted that there is a wide field for investigation into the beneficial action of certain metallic salts, when electrically injected upon lesions of the membranes of the mouth.

THE DENTAL RECORD, LONDON: SEPT. 1, 1897.

READ, MARK AND LEARN.

VARIOUS is the advice a boy receives when first he becomes a student, in the common acceptance of the term; and none is, perhaps, more often repeated than "to read hard." It may, therefore, savour of useless repetition when we, in our students' issue, again belabour this subject. Let our excuse be this, first, experience has lead us to believe, that, in dental subjects at all events, the student's reading is far too cramped within the narrow limits of a few text-books; and, secondly, that none of the schools in the United Kindom show any earnest desire to supply their students with a proper library. We suppose dental schools would be regarded as seats of learning—seats they may provide, of a sort, but what of the learning—when there are no books; and it is impossible for the average student to provide himself with copies of all those books into which he might dip with advantage; nay, some are out of print and cannot readily be bought. When dental schools first were formed dental literature was of no extensive kind, some books there were of an interesting sort, and others which have since become classic. Now, however, books on dental and cognate subjects may be counted by the hundred, and we make bold to say that the school which procures the most complete and the best arranged library will ensure for itself the most abiding success. In the absence, however, of any school library, the student must avail himself of other opportunities for getting books. The library of the Odontological Society, such as it is, is unfortunately closed to dental students. In London, however, the student will find greater hospitality extended to him at the College of

Surgeons, and there is also the British Museum. Many provincial towns have large public libraries, though we do not know to what extent they may be of use to dental students. The student should avoid reading in a rambling way; he should have some definite object in his reading, and keep this object in view. This may be suggested by a lecture, a clinical case, or in many other ways, but for the reading to be of use let it be concentrated on one subject, and let notes be taken of each book read. Notes should be brief and to the point, and collected into one book. It is a mistake to scatter notes over many books. It has always seemed to us that the best plan is to take ample notes of lectures and to amplify these from reading. Or, if it be preferred, some simple text-book can be interleaved with plain paper, and thus also act as a note book. The idea being to get within as small a compass as possible the result of much reading. It would be folly for us to name books which each student should read; this would destroy the system we are advocating, because we believe that reading a portion of a book, with some definite object in view, will repay a student better than reading the whole book, with no very particular object and with very latent interest. The student would, therefore, be directed to the book he requires by a quotation at lecture, by a reference in his ordinary text-book, or merely, perhaps, by the title suggesting the book as one likely to help him on the subject which requires elucidating. We feel sure that, if from the beginning of his curriculum he follows this plan, his own note book will be his truest friend when the examination day draws near. Students often crave for a cut and dried system—something conclusive and dogmatic; nothing is certain in this most uncertain of worlds, and he who contents himself with such a system is a very lop-sided student, or, indeed, not a student at all.

News and Notes.

J. D. Ross-Watt, L.D.S., Edin., L.R.C.P. and S. Edin., has been appointed Hon. Dental Surgeon to The Frere Hospital, East London, Cape Colony, South Africa.

An itinerant musician applied to the Medway Guardians, at Chatham, on Saturday, August 28th, for a set of false teeth, as, having lost his own, he was unable to blow the cornet. One of the guardians sympathised with him, and urged his colleagues to comply, as they had already provided tooth brushes, tooth powder, and glass eyes for workhouse inmates. The Board, however, declined the request.

The son of W. Helyar, L.D.S., of Clifton, had a narrow escape from drowning at Ilfracombe recently. While on the rocks under the Tors he was caught by the tide, and, after the lapse of several hours, was seen by the crew of a tug, who tried to rescue him, but failed. A steamer then came to his assistance, and two boats started for the spot, while the coastguard went along the cliff with the rocket apparatus. Thousands of people assembled on the Capstone, and intense excitement prevailed. Owing to the surf, the boats could not land, and eventually the imprisoned gentleman tried to swim through the breakers, but was beaten back. A second attempt was, however, more successful, and he was picked up in an exhausted condition, and landed at Ilfracombe Pier amid loud cheers.

During the July Examinations the following gentlemen passed the First Professional Examination for the License in Dental Surgery :—William Gerard Morgan, Edinburgh (with distinction) ; Campbell Hossack Baxter, Grimsby (with distinction) ; Charles Smart, Musselburgh ; Charles Frederick Turnbull, Sunderland ; George Reginald Brittan, Plymouth ; Alexander Campbell, Alexandria, N.B. ; Alfred Ebenezer Park, Edinburgh, and Adam Currie Reekie, Edinburgh ; and the following gentlemen passed the Final Examination and were admitted L.D.S. Edinburgh :—James Coltman, Newcastle-on-Tyne (with distinction) ; John Norman

Macdonald, Lincoln; John Thomson Kilpatrick Thomson, Glasgow; George Albert Lloyd, Denbighshire; Thomas Percy Wolston Watt, Ceylon; Arthur Capper, Huyton, Liverpool; Alexander Munro, Edinburgh; George Braidwood Wilson, Liverpool; Charles Nelson Park, Campbeltown, and Sydney Joseph Smith, East Preston.

At the Coroner's Court, in Horselydown, on August 27, Mr. A. C. Langham held an inquest with reference to the death of Ann Deuss, 51, the wife of a porter, residing at Hanover Buildings, Southwark.—Charles Deuss, the husband, stated that some six weeks ago his wife had to have two of her front teeth extracted, and in place of them she had two false ones put in. From this time she could never get any proper rest. Her jaw swelled so that it became almost impossible for her to eat, and she had violent pains all over her body, and especially in the head. After she had worn the false teeth a month she said she could bear the pain no longer, and would take them out. This she did, but the pains and the swelling did not go away, and she began to suffer terribly with indigestion, which affected her head. On Tuesday witness went out, leaving his wife in bed, and later in the afternoon he heard that the neighbours had found her dead in bed.—Dr. S. R. Thompson, of 5, Fair Street, said that he was called when the woman had just died. He had made a post-mortem examination, and found that death was due to sanguineous apoplexy.—The Coroner: Would that have anything to do with the teeth?—Witness: It would be an exciting cause, which is accountable for most cases of apoplexy. The excitement and strain on the nerves would affect the blood-vessels in the head and produce apoplexy.—The jury returned a verdict of death from natural causes.

An inquest was held on August 24th, at the St. Pancras Coroner's Court respecting the death of Griffith Evans, aged seventeen years, a Civil Service Clerk, lately living at 17, Chalcot Crescent, Primrose Hill, who died from chloroform when undergoing an operation on August 22nd.—John Evans, a retired draper, living at 11, Partingdon Terrace, Barmouth, North Wales, identified the body as that of his son, who generally enjoyed good health, and of whose death he heard on August 23rd.—Dr. William Griffiths, of 22, Mornington

Road, Regent's Park, stated that the deceased, who was his cousin, came to see him on August 18th, and complained that he was in great pain. Witness examined him, and found his mouth in a bad state. On Friday he again saw him, and advised him to undergo an operation. On Sunday morning he took the deceased to the London Temperance Hospital, Hampstead Road, for the purposes of the operation. Chloroform was administered to him by Dr. Myler, witness examining him before the operation, and finding his organs all right. Deceased had been under the influence some few minutes, and witness had removed half-a-dozen stumps of teeth when he noticed that he became livid, on which the chloroform was stopped, and artificial respiration was used ; but it was of no avail, deceased expiring. Death was from syncope whilst under the influence of chloroform. The Coroner said this was the second case within a few days that he had held. It was a wonderful thing that there were not more deaths. The jury returned a verdict of death from misadventure.

Mr. W. B. HULME, City Coroner, and a jury held an inquiry at the Guildhall, on Tuesday, August 17th, into the death of Ada Ann Hadland, aged 30, who died suddenly on Monday after having had a tooth extracted.—George William Hadland, plumber and painter, 21, New Bank Street, Worcester, husband of deceased, said that deceased had been in feeble health for some years. She had been subject to toothache, but he had not lately seen her hysterical. On Saturday and Sunday nights she was suffering from toothache. Witness went to church on Sunday evening, and on returning, received a message that his wife had had a tooth out and was hysterical at Dr. Corder's. He there found her half conscious on a couch. He asked her if she could walk home, but she said "No, no, no." He took her home in about half-an-hour in a cab, Dr. Corder accompanying them. Deceased was undressed and put to bed ; she seemed to be asleep. About four o'clock on Monday morning he was called to deceased, a difference in her breathing being noticeable. Two of deceased's sisters had been with her, and one went for Dr. Corder. About seven o'clock there was a change in deceased's breathing, which ceased suddenly, and she died. Witness had not thought that there was any danger.—Mr. E. H. Corder, Surgeon, Worcester, said that some years ago he extracted some teeth for deceased, and she was then hysterical; but he did not remember that there was any difficulty in bringing her round after an anæsthetic. On Sunday night, about 7.30, deceased called and asked him to take out a tooth which was loose. There were several persons in the house at the time. Witness took out the tooth without the least difficulty. There was very little bleeding. He left the room for some warm water, and when he returned deceased was falling off the chair on to the floor. Immediately after the tooth had been taken out she burst out crying and laughing in a hysterical manner. When she fell, he treated her for a fainting fit, unfastened the tight garments, and gave her ammonia. In about five minutes she said she could walk, and he assisted her to the couch. There she became hysterical again, and he sent across the road for Dr. Jackson. He did this for the satisfaction of the friends, but nothing was done after his arrival. She seemed in a semi-conscious condition, for she responded to questions. He saw her put to bed, when there was nothing in her condition to alarm him. Witness saw her at four o'clock in the morning, and though she had been worse, she was then better. He sounded her heart, which was beating very rapidly, but was not diseased. He did not think she would die. He thought death was due to syncope, brought on by nervous shock, as she was in a very weak state of health. On going to him she said she was very ill, and he took out the tooth because he thought if the pain was relieved she would be able to sleep. Mr. Hadland asked why, knowing she was ill on a similar occasion four or five years ago, Mr. Corder took out the tooth without any of her friends being with her? Mr. Corder said that the deceased came on purpose, and as the tooth was loose he did not apprehend any danger. Patients, in such circumstances, generally came alone. Mr. Hadland: Was there anyone in the room when the tooth was taken out? Mr. Corder: No; only myself. Mr. Hadland: It seems rather strange that she fell—— The Coroner: You must not make a statement, but ask questions. A juror: The tooth may have had nothing to do with death. Mr. Corder said he was glad that question was raised. He thought death might probably have occurred had the tooth not been taken out. She had in fact worked herself up to such a high pitch of excitement that he attributed death to this and her weak state of health. Mr. Jackson deposed to going to Dr. Corder's, at the latter's request, on Sunday evening. He examined her. She had a very good pulse, and the pupils of her eyes were small and equal, and showed no signs of hæmorrhage. He saw nothing wrong in her condition. He had frequently seen the same condition in patients after small operations. He agreed with Dr. Corder as to her removal home. In his opinion deceased died from syncope—a very rare termination to such cases, but a reasonable conclusion considering her state of health. There was nothing to suggest any alternative but death from natural causes. In answer to Mr. Corder, witness said he thought he should have felt justified in taking out the tooth in the same circumstances. The Coroner said that if the jury thought a post-mortem examination necessary he would adjourn the inquest. The jury thought an adjournment unnecessary, and found a verdict of death from syncope, in accordance with the medical evidence.

On Saturday, August 14th, Mr. F. Llewelyn Jones, Deputy Coroner for Flintshire, held an inquest at Rhyl, on the body of Mary Jane Kendrick, of Cerrigllwydion Arms, Llanynys, near Denbigh, who met her death at Rhyl on Friday, under circumstances which have created much local sensation.

The first witness called was Catherine Davies, of Cerrigllwydion Arms, Llanynys, a great-aunt of the deceased, who gave formal evidence of identification. The deceased was 29 years of age, and had lived with her from childhood. She accompanied her to Rhyl, on Friday, to see the dentist, and accompanied her to Mr. Keatinge's surgery, arriving there at about 12.30. She went with her to the operating room, where she was to have the whole of her teeth extracted. It had been previously arranged at Denbigh that chloroform should be administered. She was in the room when the chloroform was administered, and remained in the room until she could stand it no longer, and she was removed to another room.—Frederick Jenks, L.D.S., said he was an assistant with Mr. Keatinge, surgeon dentist, Rhyl. Deceased consulted him about 12 months ago with the view of having her teeth extracted, and he advised, if she wished to have them extracted painlessly, that chloroform should be administered. At the time she did not seem inclined to undergo the operation. On Wednesday she consulted him again, when he noticed that the condition of the mouth was very much worse than when she first consulted him. He pressed her to have them extracted, and made an appointment with her to come to Rhyl for that purpose on Friday. In accordance with the appointment the deceased came to the operating room on Friday and he sent for Dr. Goodwin, who examined the patient preparatory to administering the drug. She appeared to take the chloroform very well. At the proper time he was advised by the doctor to commence operating. He commenced operating about 15 minutes after the chloroform was administered. He had extracted three teeth when the doctor stopped him, as he considered there was something wrong with the patient. He found that the breathing had ceased, and he proceeded in the usual way to restore her. They gave her up in about twenty minutes after they first noticed that something had gone wrong. He had had considerable experience as an operator in chloroform cases, and he knew of no other anæsthetic efficacious for such an operation, as it would occupy about twenty minutes. Gas would not be suitable, owing to the number of teeth that had to be extracted, because one dose of gas would only last abont a minute and a half.—Dr. Wychliffe Goodwin, M.B., C.M., said his surgery was next door to that of Mr. Keatinge. About twenty minutes to one on Friday Mr. Jenks came into his consulting room and told him he had a patient requiring an anæsthetic, as she had to have a large number of teeth extracted. He informed him that her own doctor had told him that she was in a fit condition to undergo the anæsthetic. He went to Mr. Keatinge's and saw the patient. He first examined the mouth and found it was in a diseased condition, and it required the teeth to be taken out. She said she was willing to take an anæsthetic, and as it was a case in which gas was useless he suggested chloroform. He examined her in the usual way, and in his opinion she was a fit subject to undergo the operation. He then proceeded to administer chloroform with a mask and she took it without any hesitation or trouble. Just before the operation itself she struggled slightly, as was usual in cases of the sort. When she was completely under the influence of chloroform, and after the lapse of about a quarter of an hour, he told Mr. Jenks that she was ready for the extraction, and he proceeded to extract the teeth. After he had taken out three teeth he noticed that deceased became blue in the face and her breathing ceased. At that point they lifted her from the chair on to the floor. They used the prescribed remedies in a case of this sort, but without avail. To all intents and purposes she was dead within three or four minutes after she was put on the floor. It was quite a usual thing to administer chloroform in cases of dental surgery which occupied some time, and chloroform was as safe as any other anæsthetic. There was nothing in the condition of the patient to suggest any danger whatever. She was apparently a strong woman. Death was probably due in this case to failure of the heart's action.—The Coroner, in summing up, said he did not think from the evidence there was any blame attached to either the operator or the doctor. There was always a certain risk in cases where anæsthetics were applied, and unfortunately this case was one of those where that risk had had fatal results.—The jury returned a verdict of "Death from misadventure," and expressed the unanimous opinion that no blame was attached to the medical man who administered the anæsthetic. They also expressed their deep sympathy with the family of the deceased in their bereavement.

BRITISH DENTAL ASSOCIATION ANNUAL GENERAL MEETING, 1897.

THE General Meeting of the Association was held in the Anatomical Theatre of the Medical School, Trinity College, Dublin, on Tuesday morning, August 17th.

Mr. F. CANTON, the retiring President, occupied the chair at the opening of the meeting, and immediately proceeded to deliver the following

VALEDICTORY ADDRESS.

LADIES AND GENTLEMEN,—A valedictory address is necessarily retrospective in its character, and usually contains a *resumé* of the events which have taken place during the term of the president's office.

But as in our Association we have annually a treasurer's report and a secretary's report, and these reports give a very fair and succinct indication of the course of events and of the working of the Association during the past years, it is unnecessary for me to take up your time by repeating a well told tale.

We have this year been celebrating in various ways the 60 years' reign of our Empress Queen, and the various periodicals have vied with each other in recording the expansion of the Empire, the developments of trade, the revelations of science, and the great achievements of medicine and surgery, with both of which dentistry is inseparably connected. Although in our speciality there has been nothing startling introduced to our notice, we have been assiduous in our efforts to increase the comforts, or rather to mitigate the discomforts of our patients, and to modify the mental trepidation of those who, under the stress of circumstances, have to seek our aid.

The signs of educational advance have been marked by the discussions of methods of teaching, and by an increase in the demands made upon the candidates for our special diploma, and also in the direction which our scientific investigators have taken during the past year or two.

We have not been troubled with debating and re-debating the possibilities of implantation, transplantation, and replantation, and such like topics as barely touch the fingers of scientific discussion, but in exploring some of the more occult processes and conditions of development and dentition, and the minute anatomy of the teeth and in the almost virgin field of bacteriology.

Our investigators, both at home and abroad, have shown that they are actuated by the true scientific spirit, which prefers quiet and unostentatious progress to the applause of popular wonder and ignorance.

On the whole, then, I think I am safe in saying that our advance in dental science and practice equals, if not surpasses, that made in medicine and surgery, although we cannot consider our calling as a profession more than of 18 years' standing.

For reasons already stated I do not propose to go into details of this progress, and, moreover, the President of the Southern Counties Branch went considerably into this in his address, delivered at Croydon.

The great advance made in our profession I consider very largely due to the existence of this Association, which, by bringing men together from various parts of the kingdom, as it has done to-day, has done much to extend our knowledge and to keep the profession a united one.

The progress of the Association may not be rapid enough to please some, and others do not hesitate to prophecy, if not a wide rupture in our ranks, at least a falling off in numbers, which portentous utterances are not new, and up till now they have not proved true, and I am thankful to say that our members increase, and that the great rupture is as far off as ever. I honestly believe that both our Business Committee and our Representative Board do their best for the true interest of our profession and for the welfare of our Association. But even if our progress be slow (which I do not admit), it is, to my thinking, sure, and that is not an unimportant consideration.

Meeting, as we do to-day, in this City of Dublin, and cordially received by our professional brothers, one is tempted to indulge in a nine years' retrospect ; yet, here again, I feel that I might be an intruder on the domain of my successors, but this merely I may venture to say, that we all remember the great success of that meeting, with its wonderful museum, which was felt by many to be worthy of more than an ephemeral existence, and with its admirable and generous arrangements, both for business and pleasure, and I am sure that I may venture to say that if our present meeting were entirely devoid of all those features that make our annual gatherings so enjoyable, the memory of nine years ago would supply us with a reserve of pleasure sufficient to carry us through the dullest meeting that could be imagined out of Ireland—I could not imagine a dull one in it.

My year of office having come to an end, it only remains for me once again to thank you for the honour you have conferred on me, and to ask Dr. Stack to kindly take my place in the presidential chair of our Association.

Addressing Dr. Stack, Mr. CANTON said :—Dr. Stack, in asking you to take my place, I am sure I am only expressing the wish of the whole meeting in wishing you a very prosperous year of office.

The PRESIDENT then took the Chair amidst the cheering of the members.

On the motion of Mr. G. M. P. MURRAY, seconded by Mr. BIGGS, a hearty vote of thanks was passed to the retiring President.

The TREASURER (Mr. W. Hern) read his report.

Mr. SMITH-TURNER moved the adoption of the report, which was seconded by Mr. SHERLOCK, and agreed to.

The SECRETARY (Mr. W. B. Paterson) read his report.

On the motion of Mr. McCULLUM SMITH, seconded by Mr. P. O'MEEHAN, the report was adopted.

MEETING IN 1898.

The SECRETARY read the report of the Representative Board, which recommended (1) That the invitation to Bath from the Western Counties Branch be accepted; (2) that the date recommended by the Western Counties Branch, viz., Whitsuntide, be accepted; and (3) that Mr. W. A. Hunt, M.R.C.S., L.D.S., of Yeovil, be President.

The report was adopted.

Mr. SMITH TURNER considered that the election of a President of the Association was a matter of some importance, and that it was only respectful to the gentleman who was to be elected that a special resolution should be passed electing him. He therefore moved that Mr. W. A. Hunt, of Yeovil, be elected as President for 1898.

Mr. W. HEADERIDGE seconded the motion, which was carried with acclamation.

The following gentlemen were elected to the Representative Board:—Messrs. J. Ackery, G. Brunton, W. H. Coffin, H. Byng Mason, W. Breward Neale, Lawrence Read, G. G. Campion, S. J. Hutchinson, C. Robbins and J. C. Storey.

REPORT OF THE SCHOOLS COMMITTEE.

The SECRETARY read the Report of the Schools Committee.

The further formal business of the meeting was then adjourned to Thursday, in order to allow the Rev. S. Samuel Haughton, F.R.S., and Sir John Banks, K.C.B., the opportunity of welcoming the Association to Trinity College.

The Rev. Dr. HAUGHTON, who was received with cheers, said it afforded him great gratification to welcome the Association to the ancient college of Trinity.

Sir JOHN BANKS, K.C.B., said he had the greatest pleasure in joining the Provost in bidding the members a hearty welcome.

Mr. J. SMITH TURNER replied on behalf of the Association.

The PRESIDENT then delivered the following

PRESIDENTIAL ADDRESS.

GENTLEMEN OF THE BRITISH DENTAL ASSOCIATION,—I thank you all, from England, Scotland, Wales and Ireland, whose votes have made me your President. This is an honour that is peculiarly gratifying to me, because I feel that it is a great kindness on your part to overlook my obvious defects, and equally do I feel that it is a recognition on your part of my having devoted much of my time during the last 20 years to advance the professional position of the dentist.

Although I have been engaged in this work for 20 years, I feel myself comparatively a tyro when I see around me certain veterans who have always upheld the status and dignity of the dental profession. We have in our own city Mr. Corbett and Mr. Moore, gentlemen who have upheld the character of our profession each for a period of over 60 years; and we have among us, I am happy to say, to-day, a gentleman whom we all recognise as having thrown himself heart and soul into the cause of dental progress, who has, I believe, never been absent from one of our annual meetings; whose counsel has guided us through many a difficulty, and whom the unanimous voice of the dental profession delights to honour, that is Mr. James Smith-Turner, of London.

Now, I am not going to even rapidly sketch the immense progress that our profession has made since the late Sir John Tomes and Mr. Turner threw all their energies into obtaining for us a recognition by the Imperial Parliament in the year 1878, but all the same I feel, and I believe we all feel, that the man now living who has done most for our cause is Mr. Turner, and I am greatly cheered and gratified by seeing him again amongst us to-day. He and others of those who have fought along with him in our early struggles are here to-day in considerable numbers, and the numbers would have been still greater except for several unavoidable and counteracting causes. The Jubilee of Her Gracious Majesty has, to a certain extent, diverted into its enthusiastic channel certain streams, which in the ordinary course might have flowed towards a holiday in Ireland about this time of year. Then we have the International Medical Congress taking place this week, in Moscow, which has drawn from our ranks a considerable number of cultured dentists.

Now it is a hopeful sign of progress that we find a large number of the younger members of our profession attending this meeting in Dublin; and this zeal on their part to advance the interests of our Association, and by their presence and scientific contributions to stimulate and encourage a large attendance, is a most hopeful sign of our Association. It demonstrates that the Association has within it the elements of vigorous life, and it gives promise that those who in its earlier years were its organisers, may confidently look forward to continued progress and enduring vitality in the Association as it waxes in age and influence.

A meeting such as this is of great advantage in many ways to the locality in which it takes place. The reason of this simply is that it brings vividly before everyone the absolute truth of the aims of our Association, and since our objects are good, and since we know that they all tend to the advantage of the public, we desire that they should be brought before the bar of public opinion with clearest illumination. Each large centre where the influence of the Association has permeated has at once felt the professional instinct of organising a large amount of help without fee for those who are unable to pay for professional assistance. Notably here in Dublin, after our last meeting in 1888, the public at once came forward and supported our efforts on behalf of the Dental Hospital of Ireland, and put the committee of that charitable institution in possession of funds, insufficient indeed to carry out all our aims, but sufficient to make a very great advance on anything that had existed before, and it is to that assistance of the public that the existence of the present Dental Hospital in Lincoln Place is entirely due. I hope and look forward to the probability of this meeting so influencing public opinion that we may be able in a short time to complete the buildings necessary for a fully equipped dental hospital. Now, the advantages of such an institution to the poor are very great. At the present moment in our dental hospital there are on the staff of the institution 25 gentlemen giving their services without fee or reward, and giving it in that organised way which very much multiplies the advantages that could possibly accrue to the poor by the same number of dentists giving charitable services in an isolated manner. All the work undertaken for the benefit of the poor in the dental hospital is excellently done. The poor are just as well treated in the dental hospital as the rich can be elsewhere, no matter what fee they pay.

Now, this organised concert of a large number of dentists, brought about by the common interest that they feel in their work at the Dental Hospital, is of great value in many ways. In the first place, it heartens up the dentist himself and makes him more efficient. He feels that he has a large brotherhood in his profession, men who how much soever there may exist among them an honourable rivalry in private practice, are still able to sympathise cordially with one another in their charitable work. Then this professional fraternity between them has certain further developments. It fosters a certain generosity on their part to impart their own experience and knowledge to the pupils attending such an hospital, and thus they gradually train up in a liberal way, and with many advantages for learning their profession thoroughly, a new generation of thoroughly educated dentists. This, of course, is an immediate gain to the richer section of the community. It strikes at the root of any professional monopoly, and should be absolute proof to the public that those who promote such views have the first qualification for being classed among professions, namely, the desire of imparting knowledge to others without restriction. Then where many minds meet together and discuss and advise on all sorts of professional problems, there is certain to be a rich harvest of results, beneficial alike to the poor and to the rich.

In our dental hospital here in Dublin—and the same applies to the great dental hospitals of London, Manchester, Birmingham, Liverpool, Edinburgh, and Glasgow, and other dental hospitals—there is a constant endeavour to solve the difficulties of diagnosis and treatment. Among the more recent advances in dentistry there is a great deal to which it would be uninteresting to allude in a semi-public address, but I think it may be interesting to a mixed audience briefly to allude to the development in our hospital of what can be done by means of the Röntgen photography. I will ask my friend, Dr. W. S. Haughton, to throw on the screen some magic lantern slides made from such photographs. (Here, by means of a magic lantern, a number of interesting skiagraphs were demonstrated by Dr. W. Haughton).

All these points, as these photographs will have shown you, are easily cleared up by the Röntgen photography.

Now the development in this and in similar directions is entirely due to the open discussion of such matters by a large body of professional men, and as far as I can see such open discussion would not in all probability have ever taken place here unless we had a dental hospital established in Dublin. While, therefore, it is a great pleasure to the dentists themselves to meet and discuss these matters of scientific interest, the gain to the public is equally great in the enhanced education of dentists in general, not only of those connected with hospital work, but all other dentists who read our journals.

Let me remind my audience again that these and similar results are due to the establishment of a proper dental hospital in this city; let me again remind you that the establishment of such an hospital followed immediately on the large gathering of dentists from all parts of the United Kingdom in Dublin in 1888, and when I consider the advantages derived by all classes, by the rich and by the poor, I feel no surprise that our city welcomes you, that our ancient university has received us in an exceptionally gracious manner, that the Royal Colleges have liberally aided us, that the Science and Art Museum, the theatre of the Royal Dublin Society, and all buildings that we have asked for have been granted to us for our meeting.

It remains for me to assure you in the most emphatic manner that we, your professional brethren in Ireland, give you, who come to us from Great Britain, from the Continent, from America and from our Colonies, a most hearty welcome.

On the motion of Mr. DANIEL CORBETT, seconded by Mr. ROBERT MOORE, a hearty vote of thanks was passed to the President for his Address.

The first paper read was one by Mr. W. BOOTH PEARSALL, F.R.C.S.I., entitled "Aids in Practice." He said that little was done to make the profession a progressive one in accurate observation. The charts erred in two directions—in the use of shaded rather than diagramatic figures of the teeth, and in the fact that the cuspings of the molar teeth were almost invariably the creations of fancy, and the normal anatomical condition was overlooked. He used two kinds of charts, one for permanent record and the other for chair side use. The permanent record chart was of such a size that it could be used in an Amberg File for rapidity of reference. There was ample space for the charting of particulars of fillings or extractions. The treatment could be enterred by any method of rotation the dentist considered suitable to his needs. The chart for the maxilla and the mandible was reduced to a quarter the size of the permanent record chart, as being more manageable.

Mr. WEST expressed the regret of the members that in consequence of a domestic affliction and ill-health Mr. Booth Pearsall was unable to take any active part in the meeting.

Mr. W. BOOTH PEARSALL, F.R.C.S.I., also communicated a paper on "The Edentulous Mouth." He said that writers on mechanical dentistry appeared to have overlooked some of the difficulties to be met with in making artificial teeth. If all mouths denuded of teeth were of exactly the same shape and size a well established routine would have been marked out long ago. In the standard books no attempt had been made to describe the common types of edentulous jaws, much less to classify them. The symmetrical edentulous mouth was found with a well-marked alveolar ridge on the mandible. Absorption of the alveoli had proceeded very slowly after the loss of the natural teeth, and a substantial ridge was left on the mandible, well above the mylo hyoid line, on which to rest the denture needed to articulate with the one for the upper jaw. The maxillary alveolar ridge was also well pronounced, and both ridges were covered with thick and elastic gum tissue. With ordinary care excellent impressions could be taken of both maxilla and mandible. The bite or occlusion of the jaws was normal and therefore symmetrical with respect to the arches of the maxilla and mandible. An intelligent patient under such circumstances could generally retain dentures in the mouth without the aid of spiral springs after some practice. In another type hardly a trace of alveolus was left. The floor of the mouth moved during the action of the tongue above the mylo hyoid ridge on each side. The gum was thin and sensitive and the occlusion normal. In that case the lower denture had to be designed to float on the mandible moored in position by the aid of spiral springs. A third type was where a wasted and flattened maxilla was found as well as a wasted and flattened mandible. The gum was thin and of a pale colour. In sensitiveness the tissue was normal, but occasionally would be found to resent heavy pressure when prolonged for many hours. If the patient were of the gouty diathesis the removal of the dentures from the mouth was frequent, although close inspection would not reveal any sore spots, or abrasions, which needed rest, the discomfort being situated in the periosteum of the jaws. The next type was the "Eccentric," from the lack of symmetrical relations between the maxilla and mandible. The maxilla would be found moved from the middle line of the skull, so that one alveolar ridge was outside the alveolar ridge of the mandible below it. The maxilla was sometimes found covered with thick gum tissue and with a very soft and vascular surface. The mandible also was but thinly covered with gum, and easily fretted if the absorption was so complete as to expose the mylo hyoid ridge. This type could be recognised by a skilled observer before taking impressions of the mouth. The bite in all cases should be confirmed. Another class of the eccentric edentulous mouth would be found in which the maxilla was covered with a very soft or spongy gum and possessed a round or flattened alveolar ridge. It was not to be wondered at that successful dentistry had frequently to rely on the use of spiral springs to retain dentures in the mouth. Suction was often a failure owing to the thin and sensitive gums, and the form of vacuum adhesion was comparatively unavailable on the mandible. The rule of thumb way of setting swivels was not the way to secure successful results, as the springs were apt to be set akimbo by leaving that procedure till the work was completed. Swivels should be made as parallel as possible in their action. His experience was that the position for the swivels and springs should be determined before the teeth were mounted. He had designed a tool for the purpose which had in several cases of eccentric bite made the result certain.

Mr. HEADERIDGE said he had had something to do with arrangement of springs during his lifetime, but he would never dream of adopting Mr. Pearsall's method. In the olden days the springs were fixed with tube wire, which consisted of a piece of wire made from ordinary plate, doubled up together ; it was soldered and drawn out in the ordinary wire plate, and head screws were made to fit it. It was fixed on to the upper and to the lower. If it were a lower bone plate there were holes drilled through the lower, and washers were used to screw it on the inner side. He had never found it requisite to adopt a lot of machinery in order to find out where to put the spring.

Mr. CAMERON ROGERS admired the mechanical ingenuity displayed in the paper. As a practitioner of long standing he did not advocate the use of springs but in some cases it might be found necessary to use them. Mechanical contrivances tended to facilitate the work of the profession, and it was a great advantage to have a contrivance like that described in the paper.

Mr. W. W. HARGRAVE asked at what point the lower spring should be fixed to the upper.

Replying to the discussion on behalf of Mr. Booth Pearsall Mr. SMITH-TURNER said with regard to the position of the upper and lower fixing point, Mr. Pearsall did not pretend to be guided by any point. His position was this: that in eccentric cases the centres of the upper and lower were not the same, and if they measured from the centre with their eye they would be misled; and his desire was to get the upper and the lower swivel immediately parallel to each other, regardless of any eccentricity of the bite. Anyone who had been in practice for any number of years must be fortunate indeed if they had not met with such cases as the author had described, where he stated that everything appeared to be normal, but the lower set could not be kept in. A method he (Mr. Turner) had frequently adopted in such cases was jamming swivels. If a piece of floss silk was twisted round the swivel of the lower between the swivel and the block, that swivel was jammed, and it could be jammed at a certain angle. They would find sometimes that they could keep the plate in by jamming both, or the upper one on one side and the lower on the other, ringing the changes until they had sufficiently arranged their forces to keep the lower plate in. But there were cases where they failed even at that, and those were the difficulties that Mr. Pearsall contended could be overcome by using his machine.

A Paper was also read by Mr. F. J. BENNETT on "Some Ancient Jaws of Irish Origin."

Mr. DENCER WHITTLES, L.D.S.Eng. then read a paper on "Some Factors which cause Eruption of Teeth," illustrated with lantern slides. He said that many causes had been assigned—lengthening of the root, contraction of the dental sac, bone currents, and more recently the blood pressure had been brought to bear upon the expulsion of those organs from their bony crypts. Evolution threw much light upon the most complex structures, if they compared present highly organised creatures with the lower forms of life which might only possess lips or stomata for the prehension of food, and of course those openings would possess some form of touch corpuscles contained therein, and so, in process of time, owing to the altered environment and change of habit, those became specialized and hardened by calcification, which epidermal appendages were called teeth. The sources of tissues which afterwards became calcified were two, viz., epiblast or ectoderm, and mesoblast or mesoderm. The former tissue covered the whole surface of the body and those tracts which had communication with the outside of the body. In reviewing the works of nature it was advisable to judge the cause of the various phenomena simply as "means to an end." It was a generally accepted theory that teeth would not form without the inflexion of the malpighian layer of cells, although no enamel might be formed on the surface of the dentine, but the epithelial cells would be there, so that the presence of enamel on a tooth (as a foreign body) was insufficient to account for its being ejected to the free surface of the oral cavity or body. One of the earliest examples of an epithelial tissue took place in the human ovary, which might be described briefly as consisting of fibrous tissue with blood vessels, &c., and was covered by a layer of columnar epithelium. The ovules or immature ova were developed during fœtal life from cells which came from the germ epithelium. They got into the interior of the ovary by a process of down growth of the germ epithelium and subsequent isolation. As the ovule matured it sank deeper into the ovary, but in the later stages it came quite close to the surface, and eventually the graafian follicle ruptured, and the mature ovum escaped from the ovary to be conducted down the fallopian tube to the uterus. Its ultimate destination, whether impregnated or not, was the exterior. The whole process bore analogy to the inflexion of the oval epithelium with the subsequent cutting off of the tooth germ and final eruption to the surface. The development of the ovary showed the intimate bearing which epithelial tissue had upon connective tissue. The first sign of the ovary was a heaping up of epithelium at one place. Subsequently, underneath that, arose the connective tissue of the ovary, and that formed the bulk of the organ, while the epithelium covered its exterior with the exception of the ovules, which had come to take a place inside the ovary by a process of ingrowing and isolation. The disease of a specific character, unfortunately only too well known to them, and which all practitioners of their art should be familiar with—so far as recognising its presence in others was concerned—was syphilis. How was it that that should hasten eruption? Was it that there was increased tissue change and the toxin product acted upon the formative cells of the dentine organ, especially those which propelled the tooth to the surface? It could scarcely be due to the increased activity of the epiblastic element, otherwise there would not be a notched incisor to be seen. Could the pressure produced from below be sufficient to cause the typical Hutchinsonian tooth, and whether the peg-top like appearance was due to the increased activity of cells composing the dental sac pressing upon the last portion of enamel to be formed. In rachitis they found there was protracted eruption of the teeth. That might be due to want of energy on the part of the connective tissues. Some ascribed it to a thickening of the tooth follicle, which probably was caused by a fibrous degeneration of those cells which should in a normal organism remove the overlying tissues. The author gave the following factors which caused the eruption of teeth :—Forces below : cell proliferation at the base of dentine papilla propels the formed dentine, owing to their incompressible nature, as they retain their more or less spheroidal shape. Auxiliary forces : gubernaculum. External epithelium by maintaining direction of eruption. Forces above : absorbent cells derived from the outer wall of the tooth sac. Atrophy by pressure induced from below, due to tooth being exfoliated like a foreign body, whether consisting of enamel, dentine, or cementum minus its membrane. Gingival massage : epithelium always being present in more or less quantity at time of eruption, whose normal position is on the outside of body.

Mr. STORER BENNETT said he should like to know whether Mr. Dencer Whittles wished them to believe that at the very early period at which some of the slides were made, as soon as there was a small amount of dentine produced, those cells were already beginning to cause the eruption of the teeth? Boiling down the paper to that particular point, it seemed to him that there was a very great deal outside the scope of the title of the paper, and a good many photographs not bearing out the interpretation put upon them. It appeared to him that the Association ought not to let such a paper go out with the ægis of its approbation, making out that they saw no objection to such a theory as Mr. Dencer Whittles', because it was quite impossible to conceive any cells such as the author had shown exerting any effort of extrusion on the teeth at anything like the period which Mr. Whittles mentioned.

Mr. HOPEWELL SMITH entirely agreed with Mr. Storer Bennett's remarks. It struck him (Mr. Smith) that the cells Mr. Whittles spoke of were rather small agents in producing such a marked effect.

Mr. W. HERN also could not quite take for granted Mr. Whittles' views of the action of the cells. Some time ago he had a case of multiple dental cyst in a boy, and when the cyst was opened a lateral incisor was seen lying in the floor of the cyst. If the cells had been an important factor in eruption in that case it ought to have resulted in the tooth being lifted up out of the floor.

Mr. CAMERON ROGERS thought Mr. Whittles was to be congratulated on his very interesting paper. He understood from the paper that as soon as enamel was being formed the cellular tissue was irritated, and nature tried to relieve herself.

Mr. DENCER WHITTLES thanked the members for their reception of his paper. He had certainly great difficulty in answering some of the questions. He wrote the paper really more as a basis for discussion than the advancement of any particular theory. With regard to the cells, he simply compared them by analogy to other cells. It was found that where growth, vegetable or animal, was very prolific, it was generally carried on by the round cells. Nature's laws were so arranged that if one failed there were others to take its place, and the balance was maintained. Mr. Rogers had mentioned the enamel acting as an irritant, and no doubt it was a very strong exciting cause, especially in those teeth which had only the tooth follicle developed on one side.

Mr. CHARLES M. CUNNINGHAM, L.D.S. Edin., D.D.S. Mich., presented a "Report of an Examination of Teeth in the Arran Islands, County Galway." Out of 54 school children of both sexes, he said he had found 33 practically perfect sets of teeth and 21 imperfect. To have brought the imperfects up to the standard of efficiency would have entailed 56 stoppings and 38 extractions, or 4 operations and a fraction each. That, however, was rather misleading, as two very bad cases required 29 operations between them, 12 stoppings and 17 extractions. For the purpose of comparison with town children he examined 30 children in the Short Strand National School, in Belfast, ranging from 11 to 18 years of age. Out of that number only one set of teeth was practically perfect, and 154 stoppings and 60 extractions would have been required to bring the remaining 29 up to the standard of efficiency. Most of the town children had some notion of cleaning their teeth, whereas the island children had none. The latter's diet consisted of bread and tea (frequently without milk) fish and potatoes, and that of the town children, bread and tea, potatoes, vegetable and meat, soup, oatmeal, eggs and bacon.

At the adjourned meeting, on Thursday, the following votes of thanks were passed.

To Sir John Banks, K.C.B., and Lady Banks, for their kind hospitality.

To the Lords and Committee of the Council on Education, for the use of the Science and Arts Museum.

To Professor Alfred Scott and Mr. Choquet, for their valuable Papers.

To the Council of the Royal Dublin Society, for the use of the Theatre.

To Sir John Power and Son, for their kindness in inviting the members to their Distillery.

To the Provost and Senior Fellows of Trinity College, for the use of the College.

To the Committee of the Dental Hospital of Ireland, for the use of the Dental Hospital.

To the President and Council of the Royal College of Surgeons and the President and Council of the Royal College of Physicians, for the use of their respective Colleges.

To Dr. Grevers (of Amsterdam) and Dr. Angles, for their valuable assistance in the Demonstration Section.

And to the Readers of Papers and Demonstrators generally.

The Report of the Schools Committee was adopted

Mr. T. QUINLAN read a paper on "The Conservative Treatment of Exposed and Diseased Pulps as opposed to Extirpation." He said it was one of the most painful and important subjects they had to deal with. Only one subject took precedence of it, and that was the actual prevention of caries. He had not used a grain of arsenic for several years, and they might be inclined to think that he had sacrificed many useful organs; but such was not the case. The number of teeth needlessly extracted was a serious item to the public and to the profession, and the evil results of want of care, thought and skill, which so frequently presented itself to their notice, should certainly lead to greater and more universal efforts to reassure the public that the dentist was not necessarily an instrument of torture. The replies of patients when advised to have teeth filled and not extracted was convincing evidence of the evil and painful effects of arsenic and nerve killing. His first notable case was ten years ago, when a poor man in delicate health presented himself. Lower bicuspid, pulp exposed, tooth aching. He excavated surrounding parts, removed part of pulp, the remaining portion alive and sensitive, and washed surface with cotton and carbolic acid, Applied tannin and iodoform, covered pulp with fibre lint, soaked in enough carbolic to take up more tannin and iodoform, covered pulp by packing porcelain well to side walls in order to avoid pressure on dressing and filled with porcelain. Result, tooth saved for seven years, but since broken away, root remaining healthy. That case led to further experiments in the direction of saving all living pulps. Mr. Quinlan then gave a few typical cases illustrating his treatment. On the question of prevention, if the simple rule of dressing with fine fibre lint, carbolised or otherwise, as the case might require, covered with any white cement, were adopted for lining every large cavity, whether fitted with amalgam or gold, there would be fewer cases of pulp exposure to deal with.

Owing to the small attendance of members at the meeting, no discussion of Mr. Quinlan's paper was possible, a fact which the chairman regretted. The thanks of the members were accorded to Mr. Quinlan for his communication.

On the motion of Mr. F. J. Bennett, seconded by Mr. Dencer Whittles, a vote of thanks was accorded to the President for the work he had done in connection with the meeting, and for his kindness to the members; and the President having briefly replied the meeting concluded.

Abstracts and Selections.

THE DIRECT AND INDIRECT CAUSES OF DENTAL DECAY.

Reported by George Randorf, Berlin.

The direct and indirect causes of dental decay have been made the subject of an exhaustive inquiry by Dr. Roese, of Munich. He has found, in the course of his researches, that dental decay is distinctly connected with the shape of the head. He visited two rural districts in Bavaria and the villages surrounding Munich, and examined 4,700 recruits. All the teeth examined, those perfect and those decayed, were counted together in order to ascertain the percentage of diseased teeth. The recruits examined averaged from twenty to twenty-two years of age.

His observations have conclusively proved that the shape of the face is in direct relation with dental decay. The colour of the teeth is also an important factor. He found four distinct colours : yellow, whitish yellow, pearl grey, and blue grey. These blue grey teeth were only twice met with, and in persons inhabiting a country extremely poor in lime.

There were cases where the decay had been arrested. This he attributes to the use of the coarse black bread, whilst at Rosenheim he met with fine looking teeth which were in reality terribly decayed, and in these villages the bread eaten was white.

Mr. Weller, of Frauenfeld, has also studied this subject in Switzerland, and found the greatest percentage of decay where white, fine bread was eaten. Formerly, when hard, black bread alone was eaten, the teeth were much sounder.

At Fresing, in every hundred there were sixteen decayed teeth ; in long faces twenty and eight-tenths per cent. ; in medium-sized faces, nineteen and five-tenths per cent. ; in broad faces, thirteen and three-tenths per cent. ; therefore, the difference between long and broad faces was seven and five-tenths per cent. The agricultural population in the suburbs of Munich showed : In long faces, twenty-six and two-tenths per cent. ; in medium-sized faces, twenty and five-tenths per cent. ; in broad faces, seventeen and five-tenths per cent. ; difference, eight and seven-tenths per cent.

Why are long faces more disposed to decay ? Because, in a narrow face, the teeth are more closely set together. Often they are irregular and encroach one upon the other for want of space. The remains of food rest upon them, which causes a rapid decay of the teeth ; further, the narrower a face is, the greater the masticatory strength developed, and persons endowed with good powers of mastication are protected against dental decay.

At Viechtach, where the bread is very hard, the long faces did not show more decay than the broad. Where the greatest difference is found is where fine bread is eaten.

In regard to colour, yellow teeth are of better quality than whitish. There is no doubt that the quality of the daily bread is a great factor in the destruction or preservation of the teeth. Heredity also plays an important role, but the information on this point is still incomplete.—*Items.*

ACID TANNING.

By Dr. F. S. Brooks, Martinez, Cal.

About seven months ago I commenced experimenting with a combination of chromic and sulphuric acids in the mummification of pulps where portions remain in inaccessible root canals, and although the time may be too short yet to say what the permanent results will be, I have demonstrated one thing at least, and that is, that as a mummifying agent, this combination is unequalled.

My first experiments were upon pieces of raw beef; I took some pieces of meat one-half inch or more in thickness, and placed on them a few crystals of chromic acid, then a drop or two of dilute sulphuric acid (fifty per cent.) and left them over night. The next morning they were found to be perfectly tanned, being very hard and tough, of a yellowish colour, and impervious to water; after several hours' immersion, they were found to be perfectly dry.

A similar method is employed in some tanneries I understand where rapidity is the desideratum.

The next experiment was upon the pulp of a lower sixth year molar, the root portions of which I found it impossible to devitalize or remove. A few crystals of chromic acid were placed in the pulp chamber, then a drop of fifty per cent. solution sulphuric acid added, which was worked into the root canals as far as the patient could endure. This was followed by a paste of iodoform and oil of cassia, and the tooth filled permanently. This was over seven months ago, and so far has given no trouble except for an hour or so after the operation there was some pain. This, I find, is the case in nearly all the teeth which I have treated in this way, but is usually not severe and lasts but an hour or so, and is caused, I presume, by the chromic acid (which has a remarkable tendency to spread) passing through the apical foramen.

I have treated quite a number of teeth in this way since, and have yet to record a failure. Recently, instead of using the chromic acid in crystal form, I have prepared a solution of equal parts chromic and fifty per cent. sulphuric acids, which is kept ready for use in a glass stoppered bottle.

A convenient way of applying is to take a glass tube such as is used for a drinking tube, and by heating in the flame of a Bunsen burner, draw out to a fine point. This can be dipped into the acid and will take up a small quantity, which can be applied to the entrances of the canals. It is not necessary to flood the pulp chamber, a very small quantity being sufficient. It is well to have two or three of these tubes, bent at right angles for convenience,

Great care should be exercised to avoid touching the soft tissues, as its effects are anything but pleasant ; it can be neutralized, however, by a solution of bi-carbonate of soda, which should be kept ready in case of accident.

This method, it seems to me, has advantages over any other yet offered for the mummification of pulps, as by no other method can it be accomplished so completely in so short a time, and I would respectfully commend it to the attention of the profession.—*Items.*

CROWNING DECIDUOUS TEETH.

By Dr. Trim Houston, Corsicana, Texas.

Having noticed in *Items of Interest* for January Dr. Poulson's experience with crowns on deciduous teeth, I record the following as being possibly of interest : About six months ago a child, aged two years and three months, was brought into my office. I found the upper centrals badly decayed on the labial surfaces along the cervical border. There was also semilunar decay on the cutting edges, reaching almost to the pulps. When eating anything sweet or drinking hot or cold liquids, great pain was occasioned. I suggested crowning. The mother objected, saying that so much gold in the child's mouth would be unsightly, but I finally converted her to my views.

I used pure gold 39g. By using such thin plate the size of the teeth was increased very little, and the gold being unalloyed I was enabled to burnish the edges close up around the necks of the teeth after cementing them on with oxyphosphate.

The crowns have been in position for six months and the child has had perfect comfort.—*Items.*

ANSWER TO CORRESPONDENT.

Reece.—The sine curriculo examination of the R.C.S.I. is open *only* to those whose names are on the Dentists' Register.

STUDENTS' SUPPLEMENT.

REGISTRATION OF DENTAL STUDENTS.

THE registration of dental students shall be carried on at the Medical Council Office, 299, Oxford Street, W., or at the Branch Offices, 1, George Square, Edinburgh, and 35, Dawson Street, Dublin.

Every dental student shall be registered in the manner hereinafter prescribed by the General Medical Council.

No dental student shall be registered until he has passed a preliminary examination, as required by the General Medical Council,* and has produced evidence that he has commenced dental study.

The commencement of the course of professional study recognised by any of the qualifying bodies shall not be reckoned as dating earlier than 15 days before the date of registration.

Students who commenced their professional education by apprenticeship to dentists entitled to be registered, or by attendance upon professional lectures before July 22nd, 1878 (when dental education became compulsory), shall not be required to produce evidence of having passed a preliminary education.

Candidates for a diploma in dental surgery shall produce certificates of having been engaged during four years in professional studies, and of having received three years' instruction in mechanical dentistry from a registered practitioner.

One year's *bonâ fide* apprenticeship with a registered dental practitioner, after being registered as a dental student, may be counted as one of the four years of professional study.

The three years of instruction in mechanical dentistry, or any part of them, may be taken by the dental student either before or after his registration as a student; but no year of such mechanical instruction shall be counted as one of the four years of professional study unless taken after registration.

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* Exception may be made in the case of a student from any Indian, Colonial, or foreign university or college who shall have passed the matriculation or other equivalent examination of his university or college, provided such examination fairly represents a standard of general education equivalent to that required in this country.

Forms of registration may be obtained at the office of the General Medical Council. No fee is required for registration as a student.

RESOLUTIONS OF THE GENERAL MEDICAL COUNCIL IN REGARD TO THE REGISTRATION OF MEDICAL AND DENTAL STUDENTS.

Preliminary Examination.

1. Subject to such exceptions as the Council may from time to time allow, every dental student shall, at the commencement of his studentship, be registered in the manner and under the conditions prescribed by the *Standing Resolutions* of the Council.

2. No person shall be allowed to be registered as a dental student unless he shall have previously passed a preliminary Examination in the subjects of general education as hereinafter provided.

3. It shall be delegated to the educational committee to prepare and issue, from time to time, a list of examining bodies whose examinations fulfil the conditions of the Medical Council as regards general education.

4. Testimonials of proficiency granted by educational bodies, according to the subjoined list shall be accepted, the Council reserving the right to add to or take from the list.

5. A degree in arts of any university of the United Kingdom, or of the Colonies, or of such other Universities as may be specially recognised from time to time by the Medical Council shall be considered a sufficient testimonial of proficiency.

LIST OF PRELIMINARY EXAMINATIONS HELD IN GREAT BRITAIN WHICH ARE RECOGNISED BY THE GENERAL MEDICAL COUNCIL FOR REGISTRATION OF BOTH DENTAL AND MEDICAL STUDENTS.*

Victoria University.—Entrance Examination in Arts ; Preliminary Examination.

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* With few exceptions the Council will not in future accept any Certificates of Pass in Preliminary Examination in General Education, unless the whole of the subjects included in the Preliminary Examination required by the Council for Registration of Students of Medicine have been passed at the same time; but this rule shall not apply to those who, previous to January, 1892, have passed a part of any Preliminary Examination recognized by the Council.

University of London.—Matriculation Examination.

University of Oxford.—Responsions; Moderations; Local Examination (Junior and Senior).

University of Cambridge.—Previous Examination; General Examinations; Local Examinations, Junior, Senior, and Higher.

University of Durham.—Preliminary Examination in Arts, for Graduation in Medicine and Science; Examination for Certificates of Proficiency.

University of Wales.—Matriculation Examination.

Universities of Edinburgh, Glasgow, Aberdeen and *St. Andrews.*—Preliminary Examination for Graduation in Science, or Medicine and Surgery; Local Examinations (Junior or Senior Certificate); Examination for Degree in Arts.

University of Dublin.—Public Entrance Examination; General Examination, at end of Senior Freshmen year; Examination for Degree in Arts.

Royal University of Ireland.—Matriculation Examination.

Oxford and Cambridge Schools' Examination Board.—Lower Certificate; Higher Certificate.

Royal College of Preceptors.—Examinations for a First or Second Class Certificate (1st or 2nd Division); Preliminary Examination for Medical Students.

Royal College of Physicians and Surgeons of Ireland.—Preliminary Examination.

Intermediate Education Board of Ireland.—Junior, Middle, or Senior Grade Examination.

Educational Institution of Scotland. — Preliminary Medical Examination.

Pharmaceutical Society of Great Britain.—Preliminary and Minor Examinations *(pro tanto)*.

Scotch Educational Department.—Leaving Certificate in each grade and in Honours.

A list of examinations recognised by the General Medical Council, held at Colonial and Foreign Universities and Colleges may be obtained from the Medical Council.

REGULATIONS OF THE VARIOUS EXAMINING BODIES FOR THE DIPLOMA IN DENTAL SURGERY (L.D.S.).

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
1—PRELIMINARY EXAMINATION	Compulsory on all who commenced their Professional Education after July, 22nd, 1878. Must be registered as a Dental Student at the office of the General Medical Council, 299, Oxford St., London, W.	Compulsory on all who commence their Professional Education after August 1st, 1878. This differs slightly from that required by the English College. Must be duly registered.	Compulsory on all, except those who have passed one equivalent examination. Must be duly registered.	Compulsory on all who commenced the Professional Education after August 1st, 1878. Must be duly registered.
2—AGE at which the Candidate may present himself	Twenty-one.	Twenty-one.	Any age, but diploma cannot be granted until he is twenty-one.	Twenty-one.
3—DURATION OF PROFESSIONAL EDUCATION ...	Four years subsequent to registration,	Four years. *** For students commencing after October, 1890. (3.)	Forty-five months. (Four Academic years)	Four years.
4—COURSES OF LECTURES, &c., to be attended at a recognised School:—				
Anatomy	A Course of Lectures during not less than six months or one Winter Session...	One Winter Course. (Six months.)	One Course.	One Winter Session.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
Physiology	One Course. (Six months.)	Six months.	One Course.	One six months' Course.
Practical Physiology (separate from above)	Three months' Course.		One Course.	
Chemistry	Instruction in, which must include Practical Chemistry and Physics.	Ditto (held to embody Metallurgy).	One Winter Course.	Ditto.
Practical Chemistry	One Course.	Three months.	One Summer or Winter Course (including Metallurgy).	Three months (includes Metallurgy).
Materia Medica	Instructions in Chemistry, Practical Chemistry and Materia Medica need not be taken in the general hospital and may be taken before registration. ⁂ Attendance at Class Examinations obligatory.	Three months.		Ditto.
Dissections and Practical Anatomy	Twelve months.	One Course of Twelve months (Practical Anatomy).	Two Winter Courses (including Dissections and Demonstrations.	Twelve months (Dissections).
Metallurgy	One Course.		Included in Chemistry Lectures.	One Course.
Surgery...	Six months, or one Winter Session.	One Course.		One Course.
Medicine	Six months, or one Winter Session.	One Course.		One Course.
Practice of Surgery, and Clinical Lectures	Two Winter Sessions.	Six months (at a 'recognised Hospital.)	Two Sessions of nine months each.	Not less than six months.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
Dental Anatomy and Physiology, Human and comparative	Two Courses.	One Course. Twenty-four Lectures.	One Course.	Twenty-four Lectures.
Dental Surgery& Pathology	Two Courses.	One Course. Twenty Lectures.	Two Courses.	Twenty Lectures.
Dental Mechanics	Two Courses. *** Attendance at class Examinations obligatory.	One Course. Twelve Lectures.	Two Courses.	Twelve Lectures or Demonstrations.
Practical Instruction in Mechanical Dentistry ...	Three years under the instruction of a competent Practitioner, or under the direction of the Superintendent of the Mechanical Department of a recognised Dental Hospital, where the arrangements for teaching Mechanical Dentistry are satisfactory to the Board of Examiners in Dental Surgery. In the cases of qualified Surgeons evidence of a period of not less than two instead of three years of such instruction will be sufficient. This instruction may be taken prior to the Date of Registration as a Dental Student.	Three years under a Registered Dental Practioner, or in Mechanical Department of a recognised Dental Hospital whose arrangements are held to be satisfactory to the College (4).	Not less than three years under a Registered Dentist in acquiring a practical familiarity with the details of Mechanical Dentistry.	Three years under a Registered Practioner. Attendance at Hospital (6).

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
Practice of Dental Surgery in a recognised Dental Hospital, or in the Dental Department of a recognised General Hospitals	Two Years.	Two years.	Two years (7).	Two years (7).
5—Fee	£21 over and above stamp duty. For all Students registered *on or before* October 1st, 1894, £10 10s.	£4 4s. for First. £6 6s. for Second.	£10 10s. for First, and £10 10s. for Final. Fees for re-examination £5 5s. each part.	£4 4s. for First. £6 6s. for Final.
6—Least period during which unsuccessful Candidates are referred to their studies	Six months, subject to the decision of the Board and, before re-examination must produce a certificate of three months' additional study at a general hospital and at a special hospital.	Three months. *** No candidate admitted to this Examination who has been rejected by any other Licensing Board within three months.	Three months.	Six months. *** No candidate admitted to this examination who has been rejected by any other Licensing Board within three months.
7—Particulars of Examination	One Examination. (A) *First Day* (*Written*). On Anatomy and Physiology; and Surgery and Pathology. (Two questions on each. Time two hours.) On Dental Anatomy and Physiology; and Dental Surgery and Pathology. (Three questions on each. Time three hours.)	*Written and Oral*: (3). 1st Part—Anatomy, Physiology, Chemistry with Metallurgy.	Two examinations. *Primary:* *First Day* (*Written*). 10 a.m. to 1 p.m. Five questions on Physics and five on Chemistry, including Metallurgy, three on each to be answered. 3 p.m. to 6 p.m. Five questions on Anatomy, and five on Physiology and Histology, three questions on each to be answered.	*Written, Oral & Practical:* 1st part—Anatomy, Physiology, Chemistry, and Metallurgy.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
Particulars of Examination.—*continued*	(B) *Second Day* (*Practical*). (*a*) On the treatment of Dental Caries, and preparing filling cavities with gold or plastic filling or other material, or other operation in Dental Surgery. [Candidates must provide their own instruments.] (*b*) On the mechanical and Surgical treatment of the various irregularities of Children's teeth. (*c*) In Mechanical Dentistry. (B) *Third Day* (*Oral*). Fifteen minutes each on Anatomy, Surgery, Dental Anatomy, and on Dental Surgery.	2nd Part—Surgery, Medicine, Therapeutics, and Special subjects of Dental Anatomy and Physiology, Dental Surgery, Pathology, and Dental Mechanics. Registered Medical Practitioners are examined on special subjects only. There is a Practical Clinical as well as Written and Oral Examination in Dental and Oral Surgery, Pathology and Mechanics.	*Primary :—continued.* *Second Day* (*Written and Oral*). 10 a.m. to 11.30 a.m. (*Written*). Five questions on Surgery. Three to be answered. 4 p.m (*Oral*). 15 minutes in each of the following subjects—Chemistry, Anatomy, and Surgery. *Third Day* (*Practical*). Practical Examination in Chemistry and Histology at Royal College of Surgeons. Candidates are examined for at least half-an-hour in each subject. *Final :* *First Day*. Practical examination in Clinical Dental Surgery and Practical Operative Dentistry, and Mechanics. Candidates are required to provide their own Instruments and gold for filling.	2nd Part—Surgery, Medicine, Materia Medica, and special Dental subjects. Practical Examination at a Dental Hospital. Candidates are to bring Excavators, Files, and Plugging Instruments.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
Particulars of Examination.—*continued*			*Final—continued.* *Second Day* (*Written*). 10 a.m. to 1 p.m. Five questions in Dental Surgery and five in Dental Anatomy, three to be answered. 4 p.m. to 5.30 p.m. Five questions in Dental Mechanics (including Dental Metallurgy), three to be answered. *Third Day* (*Oral*), 4 p.m. Oral Examination, for 15 minutes, in Dental Anatomy and Physiology, Dental Surgery, and Dental Mechanics.	
8—DATE OF EXAMINATION.	May and November. N.B. — Candidates who register as dental students after Jan. 1st, 1897, are required to pass three examinations, and the curriculum differs slightly from the above. The first Examination is a Preliminary Scientific, and should be passed *during the three years* devoted to	I. *Primary* Examinations. April. July.	*Primary* Examinations. Second Monday in February, May & November. *Final* on the Tuesdays following.	May and October.
9—MODIFIED CONDITIONS OF ADMISSION TO EXAMINATION. (2). (*a*) Conditions of eligibility.		II. *Final* Examinations. Following Thursday. N.B.—Students who commenced their professional education by apprenticeship, before July 22, 1878, are exempted from the Preliminary Examination	Candidates must be registered Dental Practitioners in practice before 1878.	The Second Examination takes place on the two days following these dates.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
9—MODIFIED CONDITIONS OF ADMISSION TO EXAMINATIONS (*cont.*) (2).	Mechanical Dentistry. Particulars of these can be obtained of the Secretary.		Certificates of moral and professional character, stating he has been five years in practice, and has not attracted business as a dentist by advertising or other unbecoming practices, signed by two gentlemen holding Irish Medical or Dental Diplomas, members of the B.D.A. or Odontological societies.	
(*b*) Certificates, &c., required.			Name. Age. Address.	
			Date of commencing practice, and whether such practice has been carried on in conjunction with any other business, and if so with what business.	
			Professional status.	(8)
			Particulars of Professional Education.	Various undertakings as to Professional conduct, &c., have to be made by the Candidate.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Royal College of Surgeons, Ireland.	Faculty of Physicians and Surgeons, Glasgow.
9—**Modified Conditions of Admission to Examinations** (*cont.*) (2).				
(*c*) Manner of Examination				
Fee...		First Examination, £4 4s. Second Examination, £6 6s.	First Examination, £10 10s. Second Examination, £26 5s.	
For further information apply to Secretary.	F. G. Hallett, Esq., Examination Hall, Victoria Embankment, London, W.C.	Francis Cadell, M.B., F.R.C.S.E., Secretary and Treasurer, 22, Ainslie Place, Edinburgh.	G. F. Blake, J.P., Royal College of Surgeons, Dublin.	Alex Duncan, Esq., Faculty of Physicians and Surgeons, Faculty Hall, 242, St. Vincent Street, Glasgow.

(1.) Candidates who are Members of the College, or who have passed the Examination in Surgery of the Examining Board in England, or who shall produce evidence of having passed the Examination in Surgery for the Licence in Surgery of the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, or the Faculty of Physicians and Surgeons of Glasgow, or an examination in Surgery for a Degree in Medicine or Surgery at a University in the United Kingdom, will be exempt from re-examination in General Surgery and Pathology.

(2.) Candidates who have passed the Second Examination of the Examining Board in England, or who shall produce evidence of having passed the Examination in Anatomy and Physiology required for the Licence in Surgery of the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, or the Faculty of Physicians and Surgeons of Glasgow, or an Examination in Anatomy and Physiology required for a Degree in Medicine or Surgery at a University in the United Kingdom, will be exempt from re-examination in those subjects.

(3.) For curriculum required for Students who have commenced their studies *prior* to 1st October, 1890, see Prospectus of Regulations, page 5.

(4.) One year's *bonâ fide* apprenticeship with a registered dental practitioner, after being registered as a dental student, may be counted as one of the four years of professional studies. The three years of instruction in mechanical dentistry, or any part of them, may be taken by the student either before or after his registration as a student; but no year of such mechanical instruction shall be counted as one of the four years of professional study unless taken after registration.

(5.) Candidates who have passed the First and Second Examinations of the Examining Board in England, or who shall produce evidence of having passed the First and Second Examinations of the Scottish Conjoint Board; the third Professional Examination of the Royal College of Surgeons in Ireland; the corresponding Examinations required for a Degree in Medicine or Surgery at a University in the United Kingdom, will be exempt from the First Dental Examination.

(6.) Attendance for two years at a recognised Dental Hospital, or the Dental Department of a recognised General Hospital, in which special provision is made for the proper training of Dental Students.

(7.) Practice of recognised General Surgical Hospital required for six months.

(8.) Candidates qualified in Medicine and Surgery are admitted to the Final Examination on producing evidence of attendance in the Special Dental Courses, including Two (instead of Three) Years' Practical Instruction in Mechanical Dentistry; and they are examined on the Special Dental Subjects only. Candidates who have passed the Examination in Anatomy, Physiology and Chemistry, before any recognised Medical Board are exempt from the First Examination.

THE DENTAL HOSPITAL OF LONDON MEDICAL SCHOOL,

LEICESTER SQUARE.

DENTAL HOSPITAL.

Consulting Physician.—Sir Richard Quain, Bart., F.R.S,, M.D., F.R.C.P., LL.D.

Consulting Surgeon.—Mr. Christopher Heath, F.R.C.S.

Consulting Dental Surgeons.—Mr. T. Arnold Rogers, M.R.C.S., L.D.S. ; Mr. J. Smith Turner, M.R.C.S., L.D.S.

Dental Surgeons. —Leonard Matheson, L.D.S. ; E. Lloyd Williams, L.R.C.P., M.R.C.S., L.D.S., L.S.A. ; W. B. Paterson, F.R.C.S., L.D.S. ; W. H. Woodruff, L.D.S. ; A. Clayton Woodhouse, M.R.C.S., L.D.S. ; F. J. Colyer, L.R.C.P., M.R.C.S., L.D.S.

Assistant Dental Surgeons.—C. F. Rilot, L.R.C.P., M.R.C.S., L.D.S. ; H. Baldwin, M.R.C.S., L.D.S. ; H. Lloyd Williams, M.R.C.S., L.D.S. ; W. H. Dolamore, L.R.C.P., M.R.C.S., L.D.S. ; Percy Smith, L.R.C.P., M.R.C.S., L.D.S. ; G. Hern, L.R.C.P., M.R.C.S., L.D.S. ; J. G. Turner, L.R C.P., F.R.C.S., L.D.S. ; W. R. Barrett, L.R.C.P., M.R.C.S., L.D.S. ; Ashley Densham, L.R.C.P., M.R.C.S., L.D.S. ; N. G. Bennett, L.D.S. ; D. P. Gabell, L.R.C.P., M.R.C.S., L.D.S.

Anæsthetists.—Dudley W. Buxton, M.D., B.S. London, M.R.C.P. Lond. ; Frederic W. Hewitt, B.A., M.D.Cantab. ; Carter Braine, F.R.C.S. ; Henry Davis, M.R.C.S., L.S.A.

Assistant Anæsthetists.—George Rowell, F.R.C.S.; A. S. Bridger, M.D.Edin. ; R. Turle Bakewell, M.B.Lond., M.R.C.S., L.R.C.P. ; Harvey Hilliard, L.R.C.P., M.R.C.S.

Demonstrators.—H. J. Stevens, L.D.S. ; W. S. Nowell, M.A. Oxon., L.D.S. ; R. Herschell, L.D.S. ; H. W. Austin, M.B., M.S., L.R.C.P., M.R.C.S., L.D.S.

Medical Tutor.—D. P. Gabell, L.R.C.P., M.R.C.S., L.D.S.

Curator of Mechanical Laboratory. W. E. Fletcher.

MEDICAL SCHOOL.

Dental Anatomy and Physiology (Human and Comparative)—Charles S. Tomes, F.R.S., M.A.Oxon., M.R.C.S., L.D.S.Eng, ; on Wednesdays and Saturdays, at 8 a.m. (Summer).

Dental Surgery and Pathology.—Storer Bennett, F.R.C.S., L.R.C.P., L.D.S., on Tuesdays and Fridays, at 8.0 a.m. (Summer).

Mechanical Dentistry.—E. Lloyd Williams, L.R.C.P., L.S.A., M.R.C.S., L.D.S.Eng., on Wednesdays, at 5 p.m. (Winter).

Metallurgy in its application to Dental Purposes.—Dr. Forster Morley, M.A., F.I.C., F.C.S., on Thursdays, at 5 p.m. (Winter).

Fee for the Special Lectures and Hospital Practice required by the Curriculum, £50 in one payment, or 50 guineas when paid in two yearly instalments.

All fees are payable on day of entry.

FEES FOR SINGLE COURSES.

	£	s.	d.
Dental Anatomy and Physiology, one Course	5	5	0
" " two Courses	8	8	0
Dental Surgery, one Course	5	5	0
" two Courses...	8	8	0
Dental Mechanics, one Course	5	5	0
" two Courses	8	8	0
Metallurgy, one Course	5	5	0
" two Courses	8	8	0

Qualified Medical Men or Gentlemen holding Foreign Diplomas to practice in their native country, can receive six months' practical instruction in the Hospital, fee 20 guineas.

Students who perform Operations for Filling Teeth must provide their own instruments for the same, the approximate cost of which is £25.

For further particulars apply to the Dean, who attends at the Hospital every Wednesday from 10 a.m. to 12 noon.

Morton Smale, *Dean.*

NATIONAL DENTAL HOSPITAL AND COLLEGE,

Great Portland Street, W.

Hospital Staff.

Consulting Physician.—Sir W. H. Broadbent, Bart., M.D., F.R.C.P.

Consulting Surgeons.—Sir Spencer Wells, F.R.C.S.; Christopher Heath, F.R.C.S.

Consulting Dental Surgeon.—Sir Edward Saunders, F.R.C.S.

Hon. Visiting Physician.—James Maughan, M.D.

Hon. Visiting Surgeon.—E. W. Roughton, F.R.C.S., &c.

Dental Surgeons.—Monday, F. Henri Weiss, L.D.S.Eng. ; Tuesday, Alfred Smith, L.D.S.Eng. ; Wednesday, Marcus Davis, L.D.S.Eng. ; Thursday, T. G. Read, L.D.S.Eng., D.M.D. ; Friday, W. Rushton, L.D.S.Eng. ; Saturday, C. W. Glassington, M.R.C.S., L.D.S.Edin.

Assistant Dental Surgeons.—Monday, Willoughby Weiss, L.D.S. Eng. ; Tuesday, Edgar Beverley, L.D.S.Eng. ; Wednesday, S. F. Rose, L.D.S.Eng. ; Thursday, J. W. Pare, M.D., L.D.S.Eng. ; Friday, W. H. Wheatley, L.D.S.Eng. ; Saturday, H. J. Relph, L.D.S.Eng.

Anæsthetists.—Monday, G. B. Flux, M.D. ; Tuesday, C. E. Macleod, M.R.C.S., L.R.C.P. ; Wednesdays, C. J. Ogle, M.R.C.S., L.S.A. ; Thursday, G. Everett Norton, M.R.C.S., L.S.A. ; Friday, James Maughan, M.D. ; Saturday, Harold Low, M.A., M.B.Camb.

LECTURERS (Winter Session).

Dental Anatomy and Physiology.—J. W. Pare, M.D.Edin., L.D.S.Eng.

Dental Surgery and Pathology.—A. Hopewell Smith, M.R.C.S., L.R.C.P., L.D.S.Eng.

Dental Mechanics.—Harry Rose, L.D.S.Eng.

Dental Metallurgy.—W. Lapraik, Ph.D., F.I.C., F.C.S.

Operative Dental Surgery.—Geo. Cunningham, M.A., L.D.S. Eng., D.M.D.

Dental Materia Medica.—Chas. W. Glassington, M.R.C.S., L.D.S.Edin.

Elements of Histology.—Dr. J. Maughan, M.D.

FEES TO SINGLE COURSES.

	One Course.			Two Courses.		
Dental Anatomy and Physiology ...	£2	12	6	£4	4	0
Dental Surgery and Pathology... ...	2	12	6	4	4	0
Dental Mechanics	2	12	6	4	4	0
Dental Metallurgy	3	3	0	5	5	0
*Operative Dental Surgery	2	12	6			
*Dental Materia Medica	2	2	0			
*Elements of Histology	1	1	0			
*Demonstration on Dental Mechanics ...	1	1	0			

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* These Lectures are free to Students of the College who have fully entered for the Special Lectures.

Fee for the two years' Hospital Practice required by the Curriculum, £15 15s.

Total Fee for the Special Lectures and Hospital Practice required by the Curriculum, £31 10s.

An Entrance Exhibition, value £15, is open for competition at the commencement of each Session.

SYDNEY SPOKES, *Dean.*

GUY'S HOSPITAL DENTAL SCHOOL.

Dental Surgeons.—F. Newland-Pedley, F.R.C.S., L.D.S.; W. A. Maggs, L.R.C.P., M.R.C.S., L.D.S.; J. H. Badcock, L.R.C.P., M.R.C.S., L.D.S.

Assistant Dental Surgeons.—H. L. Pillin, L.D.S.; R. W. Rouw, L.R.C.P., M.R.C.S., L.D.S.; A. E. Baker, L.R.C.P., M.R.C.S., L.D.S.; F. M. Hopson, L.D.S.

Demonstrators of Practical Dentistry.—J. B. Parfitt, L.R.C.P., M.R.C.S., L.D.S.E.; W. R. Wood, L.D.S.E.; E. C. Dimock, L.D.S.E.; J. L. Payne, L.D.S.E.

Anæsthetists.—F. W. Cock, M.D., M.S.; J. F. W. Silk, M.D.; H. F. Lancaster, M.D.; W. J. Scott, M.B., B.S.; C. J. Ogle, M.R.C.S.; E. F. Hamilton, M.D.

LECTURERS.

Dental Surgery and Pathology.—Mr. Newland Pedley.

Dental Anatomy and Pathology.—Mr. Maggs.

Dental Mechanics.—Mr. Rouw.

Metallurgy.—C. E. Groves, F.R.S.

Operative Dental Surgery.—Mr. Badcock.

Anæsthetics.—Mr. T. Bird.

Dental Microscopy.—Mr. Baker.

Practical Dental Mechanics.—Mr. Pillin.

Dean.—Dr. Shaw.

FEES.

Special Lectures and Demonstrations, and Dental Practice only, £50, paid on entrance.

Seven guineas is charged for any further period of Dental Practice not exceeding six months.

Arrangements cannot be made for short periods of instruction.

General Lectures, Demonstrations, and Hospital Practice required for the L.D.S.Eng., £60 paid on entrance, or 30 guineas at the beginning of the first year, and 30 guineas at the beginning of the second year. From these fees a reduction of 12 guineas will be made to students who produce, on joining the school, recognized certificates of instruction in Chemistry, Practical Chemistry, and Materia Medica.

General and *Special* Lectures and Demonstrations, and to the Hospital and Dental Practice required for the L.D.S.Eng., may be obtained by payment of £110 on entrance, or of 60 guineas at the beginning of the first year, and 50 guineas at the beginning of the second year. The reduction mentioned above will be made.

The inclusive fee for the M.R.C.S., L.R.C.P., and L.D.S.Eng., is 190 guineas, or if paid by instalments at the commencement of the first year 60 guineas, second year 60 guineas, third year 40 guineas, fourth year 40 guineas.

EDINBURGH.

DENTAL HOSPITAL AND SCHOOL.

Consulting Physician.—Alex. Peddie, M.D.

Consulting Surgeon.—Joseph Bell, M.D., F.R.C.S.E.

Fee for the two years' practice required by the Curriculum, £15 15s. Fee for each course of lectures, £3 5s.

Consulting Dental Surgeon.—John Smith, M.D., F.R.C.S.E.

Dean.—W. Bowman Macleod.

Dental Surgeons.—Messrs. George W. Watson; J. Stewart Durward; Frederick Page; J. G. Munro; J. S. Amoore; David Munro.

Assistant Dental Surgeons.—T. Gregory; H. B. Ezard; Robert Lindsay; J. Alex. Young; Hume Purdie; J. Malcolm; D. Bailie

Wilson; S. Simmons; R. N. Hannah; Fred. J. Turnbull; D. R. Campbell; H. H. Chapman.

Chloroformists.—Dr. J. M. Farquharson; W. Lundie; G. Matheson Cullen; R. J. Johnston; Thomas Proudfoot, Hugh Jamieson.

Tutorial Dental Surgeon.—Mr. J. Morris Stewart.

DENTAL SCHOOL (LECTURERS).

Dental Anatomy and Physiology (Human and Comparative).—Mr. Andrew Wilson.

Dental Surgery and Pathology.—Mr. George W. Watson.

Introductory Dental Surgery.—Mr. J. S. Amoore.

Mechanical Dentistry.—Messrs. W. Bowman Macleod and J. Graham Munro.

Practical Mechanics.—Mechanician, Mr. James Mein.

Conservative Dentistry.—Mr. J. Graham Munro.

Dental Materia Medica.—William Guy, F.R.C.P. and S.Ed., L.D.S.Ed.

Gold Filling.—Mr. H. B. Ezard.

Dental Metallurgy.—Mr. R. Lindsay.

Dental Histology.—Mr. G. W. Watson.

General fee for the Hospital Practice and Special Lectures required by the Curriculum.—Hospital Practice, £15 15s. One course each of Dental Anatomy, Dental Surgery, and Mechanical Dentistry and Demonstrations, £9 15s.—£25 10s.

Fees to separate Classes.—Dental Anatomy, Dental Surgery, Mechanical Dentistry, £3 5s. each.

The hospital practice and lectures qualify for the Dental Diploma of the Royal College of Surgeons, Edinburgh, and also for that of the other licensing bodies. Second courses of the lectures, as required by the Royal College of Surgeons of England, £2 4s.

The Session, 1897-98, opens October 1st, 1897, General fee for the hospital practice and special lectures required, £25 10s.

For further particulars apply to the Dean, 31, Chambers Street, Edinburgh.

BIRMINGHAM SCHOOL OF DENTISTRY, MASON COLLEGE (QUEEN'S FACULTY OF MEDICINE).

THE teaching of Dentistry has been undertaken by the Mason College acting in association with the Birmingham Dental Hospital, and the Birmingham Clinical Board, so that students may fully qualify themselves for the Dental Diplomas of the Royal Colleges.

LECTURES FOR THE DENTAL CURRICULUM.

Dental Surgery.—Frank E. Huxley, M.R.C.S., L.D.S.

Dental Anatomy.—J. Humphreys, L.D.S.I.

Dental Mechanics.—F. Hampton Goffe, L.D.S.

Dental Metallurgy.—Percy F. Frankland, M.D.; W. G. McMillan, F.C.S., F.I.C.

Surgical Diseases of the Mouth.—F. Marsh, F.R.C.S.

Medical Diseases of the Mouth.—Stacey Wilson, M.D., M.R.C.P.

DEMONSTRATORS.

Operative Dental Surgery.—W. T. Madin, L.D.S.

Mechanical Dentistry.—F. R. Howard, L.D.S.

Dental Pathology and Histology.—Dencer Whittles, L.D.S.

General Subjects.—As taught in the Medical Faculty.

COLLEGE FEES.

A Composition Fee of £50, payable in one sum or in two sums, viz., £25 at the beginning of the first year and £25 at the beginning of the second year of studentship, admits to the full curriculum required for the Dental Diploma *(exclusive of the necessary Hospital Practice)*.

Students wishing to take the Diplomas of M.R.C.S., and L.R.C.P., in addition to their dental qualifications, pay a Composition Fee of £75. This covers all College Fees.

BIRMINGHAM DENTAL HOSPITAL,

71, NEWHALL STREET.

Consulting Physician.—Robert M. Simon, M.D.

Consulting Surgeon.—John St. S. Wilders, M.R.C.S.

Consulting Dentists.—Adams Parker, L.D.S.; Charles Sims, L.D.S.

Anæsthetists.—S. W. Hayes, M.B.; J. Henry Blakeney, M.R.C.S.; Cyril Hutchinson, M.R.C.S.; Chas. St. Johnston, M.R.C.S., L.R.C.P.; T. Sydney Short, M.B.; W. H. Pooler, M.R.C.S.

Dental Surgeons.—H. Breward Neal, L.D.S. ; Frank E. Huxley, M.R.C.S., L.D.S. ; J. Humphreys, L.D.S. ; F. W. Richards, L.D.S. ; A. E. Donagan, B.A., L.D.S. ; Frank H. Goffe, L.D.S.

Assistant Dental Surgeons.—W. T. Madin, L.D.S. ; P. T. Naden, L.D.S., L.S.A.Lond. ; F. R. Howard, L.D.S. ; J. Mountford, L.D.S. ; J. E. Parrot, L.D.S.

Demonstratars.—A. T. Hilder, L.D.S. ; W. Malcolm Knott, L.D.S.

Hospital Fees.

For Dental Hospital Practice and Demonstrations—

Composition Students (2 years)	£12	12	0
Non-Composition Students (2 years)	£14	14	0
Non-Composition Students (1 year)	£8	8	0
Non-Composition Students (6 months)	£5	5	0

For General Surgical Hospital Practice, Lectures, and Demonstrations.

Surgery (2 years)	£10 10 0	Surgery (1 winter)	£6 6 0

N.B.—Further particulars may be obtained from the Registrar, at the College, or Mr. J. Humphreys, 149, Edmund Street.

OWENS COLLEGE, MANCHESTER.

Dental Department.

Professors and Lecturers. — *Anatomy, Descriptive and Practical.*—Professor Alfred Young, M.B., F.R.C.S. *Physiology.*—Brackenbury Professor Wm. Stirling, M.D., D.Sc. *Chemistry.*—Professor Harold B. Dixon, M.A., F.R.S. *Organic Chemistry.*—Professor W. H. Perkins, Ph.D., F.R.S. *Medicine.*—Professor J. Dreschfeld, M.D., F.R.C.P. *Systematic Surgery.*—Professor T. Jones, M.B., B.S., F.R.C.S. *Clinical Surgery.*—Professor Walter Whitehead, F.R.C.S.E., F.R.S.E. *Dental Surgery.*—G. G. Campion, L.D.S. *Operative Dentistry.*—G. O. Whittaker, L.D.S. *Dental Anatomy and Physiology.*—W. A. Hooton, L.D.S., L.R.C.P., M.R.C.S , *Dental Mechanics.*—Thomas Tanner, L.D.S. *Dental Metallurgy.*—C. A. Burghardt, Ph.D. *Dental Pathology and Histology Demonstrator.*—David Headridge, L.D.S.

Fees.—£50, in two sums, at the commencement of first and second year,

THE VICTORIA DENTAL HOSPITAL OF MANCHESTER.

DEVONSHIRE STREET, ALL SAINTS.

Dean.—Mr. George G. Campion.

Consulting Physicians.—Hy. Simpson, M.D. ; D. J. Leech, M.D.

Consulting Surgeons.—Mr. E. Lund ; Mr. F. A. Heath ; Mr. T. Jones ; Mr. J. Hardie.

Consulting Dental Surgeons.—Mr. H. Campion ; Mr. G. W. Smith.

Dental Surgeons.—Mr. George G. Campion ; Mr. Edward P. Collett ; Mr. P. A. Linnell ; Mr. John W. Dunkerley ; Mr. William Dykes ; Mr. William Headridge ; Mr. W. A. Hooton ; Mr. Isaac Renshaw ; Mr. William Simms ; Mr. Walter Smithard ; Mr. Thomas Tanner ; Mr. G. O. Whittaker.

Assistant Dental Surgeons.—Mr. H. T. Dreschfeld ; Mr. D. Headridge ; Mr. F. W. Minshall ; Mr. W. H. Norman ; Mr. T. C. Sherrate ; Mr. C. H. Smale.

Administrators of Anæsthetics.—Mr. Alexander Wilson ; Mr. J. W. Smith ; Mr. F. Westmatcote.

Patients attended at the Hospital from 8.30 to 10 a.m. daily, and on Monday, Wednesday, and Friday, from 7 to 8 p.m.

The Hospital is conveniently situated for students, being between the Royal Infirmary and Owens College, and only about five minutes' walk from the latter. It contains three separate operating rooms, devoted respectively to fillings, extractions, and operations under anæsthetics and two Dental Surgeons are in attendance each time the Hospital is open.

FEES.

The fee for the two years' Dental Hospital Practice required by the College of Surgeons of England is £12 12s., which must be paid in advance, or £8 8s. for the first year and £5 5s. for the second year.

NOTE.—Students are required to provide themselves with the necessary instruments, for list of which see the prospectus of the Victoria Dental Hospital.

LIVERPOOL DENTAL HOSPITAL.

MOUNT PLEASANT.

Consulting Physician.—Thomas Robinson Glynn, M.D. M.R.C.P.Lond.

Consulting Surgeon.—Frank T. Paul, F.R.C.S.Eng.

Consulting Dental Surgeons.—C. Alder, L.D.S.; H. C. Quinby, L.D.S.; W. H. Waite, L.D.S., D.D.S.

Dental Surgeons.—Reg. H. Bates, L.D.S.Eng.; R. M. Capon, L.D.S.Glas.; E. A. Councell, L.D.S.Eng.; R. Edwards, M.R.C.S., L.D.S.Eng.; W. Maplebeck, L.D.S.I.; Thos. Mansell, L.D.S.Edin.; J. Royston, L.D.S.Eng.; Fredk. Rose, L.D.S.Eng.; E. A. Mansell, L.D.S.Eng.; J. P. Roberts, L.D.S.Edin.; C. A. Barston, L.D.S.Eng.; W. J. Pidgeon, L.D.S.Eng.; W. H. Gilmour, L.D.S.Eng.; J. A. Woods, L.D.S.Eng.

Demonstrator on Operative Dental Surgery.—

Chloroformist.—J. E. Gemmel, M.B., C.M.

House Surgeon.—

The Hospital is conveniently situated within five minutes' walk of the Medical School. There are four separate operating rooms and a work room, all facing north, and there is an abundant daily attendance of patients.

Every facility is afforded to Students who are anxious to acquire proficiency in Dental Surgery, and to prepare themselves for the L.D.S. of any of the licensing bodies.

The electric light has been introduced (the lamps being supported on brackets specially manufactured).

Fee for two years' hospital practice, 12 guineas. Perpetual, 15 guineas.

R. Edwards, *Dean.*

DEVON AND EXETER DENTAL HOSPITAL.

Consulting Surgeons.—Messrs. A. J. Cumming, F.R.C.S.Eng.; James Bankart, M.B.Lond., F.R.C.S.Eng.

Consulting Dental Surgeon.—S. Bevan Fox, L.D.S.Eng.

Dental Surgeons.—Messrs. J. T. Browne-Mason, L.D.S.Eng; Henry Bigging Mason, L.D.S.Eng.; T. G. T. Garland, L.D.S.I.; J. M. Ackland, M.R.C.S., L.D.S.Eng.; T. A. Goard, L.D.S.Eng.; W. H. Goodman, L.D.S.Eng.

Honorary Secretary.—Henry Yeo.

Attendance on the practise of this Hospital is recognised by the Royal College of Surgeons of England as qualifying for their Dental Diploma.

Pupils of any member of the staff or other registered Practitoner (being a Life or Annual Governor) are permitted to attend the practice of the Hospital, subject to the approval of the Medical sub committee, on payment of £5 5s. annually to the funds of the Institution.

DENTAL HOSPITAL OF IRELAND,

25, Lincoln Place, Dublin.

Consulting Physicians.—F.R. Cruise, M.D. ; John W. Moore,M.D.

Consulting Surgeons.—E. H. Bennet, F.R.C.S.I. ; Sir W. Stokes, F.R.C.S.I.

Consulting Dental Surgeons.—R. H. Moore, F.R.C.S.I. ; Daniel Corbett, M.R.C.S.E., L.D.S.Eng. ; W. Booth Pearsall, F.R.C.S.I.

Dental Surgeons.—Messrs. Robert Hazelton, F.R.C.S.I. ; R. Theodore Stack, M.D., F.R.C.S.I., D.M.D.Harv., L.D.S. ; P. W. W. Baker, M.D., M.R.C.S.I., L.D.S. ; Daniel Corbett, jun., A.B., F.R.S.S.I. ; George Wycliffe Yates, M.B., Ch.M., L.D.S.I. ; G.M.P. Murray, F.R.S.S.I. ; J. S. Thomson, L.D.S.Edin.

Assistant Dental Surgeons.—Shenstone Bishop, L.D.S.I. ; Kevin. E. O. Duffy, V. Doyle, G. C. Moore.

Anæsthetists.—Messrs. John G. Cronyn, L.R.C.S.I. ; John R. Graves, L.R.C.S.I. ; John B. Coleman, M.B.

Pathologist.—Willian Mallet Purser, M.D.

Registrar.—William A. Shea.

The Lectures on Dental Surgery and Mechanical Dentistry will be given during the winter, those in Dental Anatomy and Metallurgy during the summer months.

In addition to the longer courses of Hospital attendance, special courses, of three months' duration, will be given to Surgeons about to join the Army and Navy, or to practice in the Colonies or remote country districts.

Regulations as to Fees and other conditions can be obtained from the Registrar of the Hospital, or from

R. Theodore Stack, *Dean.*

MEDICAL SCHOOLS.

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Fifty-four guineas, in one sum ; or 30 guineas on entering ; 30 guineas 12 months later.

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The fees for the general subjects (including practice at the Royal Infirmary) required of dental students, according to the curriculum of the Royal College of Surgeons of Edinburgh, amount to £38 10s.

The DENTAL RECORD.

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Original Communications.

THE RELATION OF DENTISTRY TO GENERAL PRACTICE.*

By F. C. Porter, L.R.C.P., M.R.C.S., L.D.S., D.D.S.

Mr. President and Gentlemen,—When asked by our worthy secretaries to read a paper before this Society, I chose the above title as I had been frequently struck by what I may term the look of holy horror that comes over many medical men when it is suggested that dental matters in any way concern them, or that they are in any way responsible for the care of their patient's teeth. But while it is true that dentistry is to-day a special art, and beyond the bounds of general surgery, there are yet many problems lying on the borderland between dentistry and general practice that belong to the latter nearly as much as to the former, and to two or three of these I would direct your attention to-night.

The great aim of modern medical science is prevention, and this applies equally to dental science. It is in the rôle of a teacher that the medical man could do so much if he would (and I am glad to say many do), to save their patients from the effects of their own ignorance. Let me cite an incident that once happened to illustrate my point. A lady brought her daughter, aged 17, to consult me—the girl having never previously been to a dentist in her life. On examining the patient's mouth I found several teeth with exposed pulps, and scarcely one but showed some signs of decay. Of course there was a history of long continued and persistent facial neuralgia, and the mother expressed considerable surprise when I suggested there was any connection between the state of the teeth and the neuralgia, and on my explaining that to set the mouth in order would necessitate several sittings and a lot of time, replied she expected I should be able to set everything right in half-an-hour. That such ignorance should exist among soi-disant cultured people is truly lamentable, especially when we know that by judicious and timely treatment, much pain and suffering might have been averted.

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* Read before the Nottingham Medico-Chirurgical Society, April, 1897.

The treatment of the teeth after caries has commenced, of course rests solely with the dentist ; but enjoying, as he generally does, the confidence of parents, I consider it is the duty of the medical attendant to point out and urge the necessity of a regular and periodical examination of children's teeth. Take for example the case of the six year molars. They come into place behind the deciduous molars, no tooth being shed to make room for them, and they often appear before any of the permanent incisors. Little wonder then, that so many people labour under the delusion that they are temporary teeth, and therefore not worth the expense or bother of a visit to the dentist. They come, too, at an age when most children scamp on every possible occasion the use of a tooth brush, and the result is that it is no uncommon thing, on looking into the mouth of a child seven or eight years old, to find the temporary molars mere stumps, and the first permanent molars little better. The result is that the general nutrition of the child suffers, for it is not till the age of 9 or 10 that the bicuspids erupt, and not until 12 the second molars, but whose fault is it? Certainly not the dentist's.

This brings me to the subject of dental caries. It has been recommended by some authorities that certain drugs, as for example salts of lime, taken into the system will have a beneficial effect on the teeth. That it will harden them, thus rendering them less liable to the attacks of caries. In order to realise the effect of such treatment one must have a right conception of dental caries and its causes.

The earlier writers on the subject taught that decay of the teeth was an inflammation, in the ordinary sense of the word, arising on the exterior or interior of the organ affected as local circumstances ordained ; an inflammation akin to that arising in bone or any other living structure. Gradually this idea was proved to be erroneous, and it was found that dental caries was not in any sense of the word an inflammation, and that its appearance in any particular place is independant of the fact of the tooth forming a living part of a living organism. As far back as 1868 a cryptogram, to which the name of leptothrix was given, was found penetrating far into decayed dental tissues. Later on, in 1879, Milles and Underwood found other micro-organisms present, micrococci, and oval and round shaped bacteria.

From these and other observations, all pointing to the persistent presence of micro-organisms in carious dentine, it was concluded that they played an important part in its causation, but the exact *modus operandi* was for some time left in doubt. Finally, Dr. Miller, of Berlin, by a series of careful experiments, found that the ferment which caused the ravages on the teeth was a lactic acid ferment. Lactic acid is generated in the saliva, in all favourable spots to the lodgment of the organism, as in the fissures and crevices on the crowns of molars and in the interstices between the teeth, especially where they are badly formed or overcrowded. Such places form a favourite lodgment for micro-organisms, and the result of their growth, the lactic acid, acts upon the lime salts of the enamel, dissolving them until an inroad is made into the dentine. This reached, the acid acts on its lime salts as it did those of the enamel, whilst the organisms, penetrating the dental tubules, feed on and destroy the organic matrix. Thus the organism and their product play as it were into each others hands, and the decay goes on apace, till finally, where stood a good and useful tooth, nothing remains but a foul and often abscessed stump.

So much for a rough outline of the pathology of dental caries. The question we now have to ask ourselves, why is it that whereas some persons are sufferers from the ravages of caries from the days of their earliest childhood, others seem practically immune; and why it is that some person will for years enjoy comparative freedom from fresh inroads of caries, and then, without apparent rhyme or reason, suffer acutely, several teeth being attacked at once, or why, for example, do women often suffer so much from caries during pregnancy?

It has long been the custom, not only among the laity, but among dental practitioners themselves, to roughly classify teeth for clinical purposes as hard or dense, and soft or chalky, indicating that the latter were deficient in lime salts and so more prone to decay.

The truth of this statement has lately been made the subject of an exhaustive series of experiments by Dr. Black, of Jacksonville, U.S.A. He examined some hundreds of teeth from various sources and of every description and variety.

He obtained, by carefully weighing the specific gravity of the dentine, the percentage of lime salts and percentage of organic matter each specimen contained. To show the results I cannot do better than quote his own words: "Teeth decay most in youth, before they have attained the percentage of lime salts of adult age. Therefore, to know whether or not the lighter teeth decayed most in early youth I divided the teeth into three sections. The first included those under 25 years of age, the second those between 25 and 40, and the third those over 40 years old. The averages obtained show no disposition of caries to attack the lighter teeth in preference to the heavier during youth."

In order to test still further these results the carious teeth and the perfect teeth were divided into three sections. The first, containing all below 25 years, the second all between 25 and 40, and the third all above 40 years. The results were as follows: In the first section the carious teeth contained $\frac{1}{1600}$th per cent. more lime salts than the perfect teeth; in the second period, the carious teeth contained $\frac{1}{1600}$th per cent. less lime salts than the perfect teeth, and the third the carious teeth contained $\frac{1}{400}$th per cent. more lime salts than the perfect teeth. These classifications show conclusively that neither the density of the tooth nor the percentage of lime salts it contains has anything to do with its liability to caries.

Certain experiments for ascertaining the percentage of lime salts in dentine have still more recently been conducted by Mr. Charles Tomes, who has come to the same conclusion as Dr. Black—that the ability of certain teeth to resist caries does not lie in the mere proportion of the lime salts they contain.

These researches have by no means discovered the primary cause of some teeth being so prone to attack from caries while others are free; but they have at least made the discovery more easy by the elimination of the fallacy that teeth decay because they are chalky, or poor in lime salts.

Whether the resistance exercised by certain teeth lies in some peculiarity in the enamel, or of the organic matrix of the dentine, or whether, as Dr. Black suggests, there exists in the saliva of certain individuals a peculiar antitoxine inimical to the growth of the lactic acid ferment must, for the present at any rate, remain a matter of speculation.

But while in the present state of our knowledge, or rather want of knowledge, we cannot hope to improve the calibre of the teeth by direct or indirect action of drugs acting on the nutritive metabolism, much can be done locally to keep caries in abeyance.

The mouth, as we know, from a bacteriological aspect, is an all efficient breeding ground for micro-organisms.

One particular organism we know to be the active agent in promoting caries, and the lesion usually commences in some inaccessible spot where colonies of leptothrix may settle and thrive undisturbed. This fact it is that renders the tooth brush and the tooth pick, used efficiently, and penetrating into the interstices and fissures, and removing anything lodged there, such indispensable agents in the prevention of decay. As an example, we may take the wisdom teeth, which so many people imagine decay before they erupt, so soon does caries often attack them. This, I take it, is not due to the fact that the wisdom teeth are more prone to decay than any others of the set, but simply that, being more inaccessible to the brush, colonies of leptothrix are allowed to settle and flourish undisturbed. The first essential then in the preventive treatment of caries is cleanliness.

The next point I would mention is overcrowding of the jaws. Without doubt, in those mouths in which dental caries is very prevalent, and a state of overcrowding exists, much can be done to retard the spread of the disease by judicious extraction. I can call to mind overcrowded mouths in which one side has been relieved of a molar or bicuspid at the point of greatest pressure, while on the other side all the teeth have been left standing. On the side from which the tooth has been taken, the teeth are practically sound, while on the other, where no such relief has been effected, the teeth show a mass of stoppings. I mention this as a prejudice exists in the minds of many people that whatever the condition of the mouth, it is wiser to keep all the teeth in situ.

The next subject to which I would draw your attention, is that of hypoplasia of enamel, teeth thus affected being spoken of as honeycombed or pitted. The enamel, instead of presenting a clear, shiny, even, white appearance, is grooved or pitted, and often is deficient in quantity, occasionally being entirely absent. Sometimes the whole surface is defective, sometimes only partially so, the boundary line between the healthy and unhealthy being clearly marked. On examining mouths thus affected it will be found that corresponding teeth will be similarly and equally imperfect. Thus it is a common thing to find the whole of the surface of the centrals and first molars pitted, the laterals only partially so, and the bicuspids, canines, and second molars entirely free. This fact points to a constitutional origin, all teeth that were undergoing development together being equally affected. Cases of hypoplasia must not be confounded with true syphilitic teeth, with which they have nothing in common. The exact cause of the affection is still somewhat a matter of doubt It is held by some authorities that any severe illness during early childhood, when calcification of the teeth is in progress, may bring about the condition, and certainly those cases into which I have enquired give a history of some acute febrile disorder occurring simultaneously with the formation of the teeth affected. Mr. Jonathan Hutchinson, investigating the matter, noticed that the condition was often found in children who had suffered from convulsions, and was at first inclined to put them down as the cause. Finally, however, he concluded it was due to the mercury given as a cure and not to the seizures themselves. Dr. J. R. Barton, who has also investigated the subject, has arrived at the conclusion that improper feeding during infancy is the cause. Others have sought to find the cause in the abscessed condition of the deciduous teeth acting prejudicially on their successors, but as often as not they are followed by perfectly formed teeth, while quite as often, pitted permanent teeth are preceded by sound temporary teeth.

Last August Mr. Sydney Spokes read a paper before the British Dental Association, in which he brought out some interesting facts and statistics in connection with the subject. He examined in all some 2,154 mouths. Of these, 258 were college boys in one of the public schools; 987 were boys in a Poor Law school; 103 were boys in a Poor Law ophthalmic school; 726 girls in a Poor Law school; 80 girls in a Poor Law ophthalmic school. From the above he omitted 250 cases as being infants. Among the remaining 1,904 he found 147 cases in which hypoplasia was present, *i.e.*, 7·7 per cent.; among the public school boys there were 4·6 per cent.; among the Poor Law boys there were 7·1 per cent.; among the Poor Law ophthalmic boys there were 16·5 per cent.; among the Poor Law girls there were 7·5 per cent. ; among the Poor Law ophthalmic girls there were 13·7 per cent.

Broadly speaking, the healthy boys in the public school on the one hand, and in the Poor Law school on the other, may be considered as representing the conditions of wealth and poverty. In the former, with its careful and judicious feeding, we have but four per cent. of cases, in the latter, with its probable lack of proper food and its unhealthy surroundings, and consequent malnutrition, we get 7·1 per cent. The statistics given above refer of course to permanent teeth. Out of 250 infants examined with the temporary teeth still in situ, six per cent. suffered from hypoplasia. Any malnutrition in these cases must necessarily have arisen in utero, and Mr. Spokes suggests as a possible cause the prolonged attacks of vomiting, sometimes continuing into the later months of pregnancy interfering with the healthy condition of the mother, and so influencing the fœtus.

A question that has of late been exercising the minds of the dental profession, and also a section of the medical, is that of general anæsthesia in dental surgery. As the science of dentistry advances, and the education of the public in matters relating to the care of their teeth improves, the need for the wholesale extraction of roots and stumps must of necessity diminish. Speaking generally, it can be asserted, without fear of contradiction, the extraction of decayed teeth is an operation, the neglect or the performance of which, in no way endangers a patient's life. Often, it is a matter of improving health ; but sometimes only one of convenience. It behoves us therefore, in the choice of an anæsthetic, to use the utmost care in the selection, that in an operation which in itself in no way involves the risk of the patient's life, little or no risk should be run in the administration of the anæsthetic. There can be no doubt, that for the majority of cases the anæsthetic indicated is nitrous oxide. Granted, that ordinary care is exercised the danger in its administration is practically nil, while the after effects, as compared with those of chloroform or æther, can be passed over without comment. We might indeed go so far, as to say the danger from the anæsthetic is no greater than that from the shock of the extraction had it been performed without an anæsthetic.

There are, however, a considerable number of cases in which, either on account of the difficult nature of the extraction, or the number of teeth to be extracted, a more prolonged anæsthetic than can be possibly obtained with nitrous oxide is necessary. In the latter class of cases two courses are open to us. (1) To submit the patient to several administrations of nitrous oxide, or (2) to fall back upon æther or chloroform to get a prolonged anæsthesia. Where a patient lives close at hand, and his purse is a long one, the first alternative may be the wiser. But men practising in the country constantly have patients who come in from some outlying district, may be from a considerable distance, who can neither afford the time nor the money to submit to several administrations of nitrous oxide.

What, then, is the rightful anæsthetic to choose? Speaking as a dentist, and from a dentist's point of view, I give the preference to the anæsthesia being induced by nitrous oxide, and prolonged by æther. This has several advantages: (1) safety; (2) the anæsthetic can be administered in the sitting posture, thus making it easier for the dentist to perform the operation, and lessening the risk of stumps &c., slipping back into the throat; (3) the induction of anæsthesia by nitrous oxide is much pleasanter than by æther. This method has the disadvantage of requiring a special apparatus, which is more or less cumbersome for conveying from place to place; and it is out of the question to expect the busy practitioner to carry it about for the odd times he would need it in giving an anæsthetic for a dentist. In the case of all hospitals and dispensaries no such objection can be raised, and as prolonged dental operations must be of frequent occurrence in such institutions, there can be no excuse for choosing another anæsthetic in preference. Passing from æther we come to the question: Is chloroform a suitable anæsthetic for dental purposes?

Personally, I have had but little experience in seeing chloroform pure and simple administered for dental purposes, and most of the remarks and statistics I am about to give are from a paper by Dr. Hewitt, who has very carefully investigated the matter.

I must ask you to remember that I am speaking of chloroform solely in its use in dental operations.

Dr. Hewitt found, from 1890 to 1896, 37 cases of death from general anæsthetics given for dental purposes of which fairly complete records could be found. Of these no less than 27 occurred from the use of chloroform given alone; one case from chloroform followed by a subcutaneous injection of morphine; two from the use of methylene, which is found to contain a large proportion of chloroform, and one from a mixture of chloroform three parts and æther one part, thus bringing up the total of deaths in which chloroform was given in some form to 31 out of 37. Following details still further, it is found 14 deaths occurred in Scotland, with a population of four millions; 21 in England and Wales, excluding London, with a population of 23¾ millions, and two in London, with a population of 4¼ millions, thus showing the deaths in Scotland, where the drug is most used, to be four times as many as in England and Wales and eight times as many as in London.

Details as to age, sex, &c., are given in 19 cases, but are not necessary for the purposes of this paper. The position of the patient during the operation is, however, all important. In seven out of the 19 cases no mention is made of posture, of the remaining 12, six were in the semi-recumbent or sitting posture, one in a semi-recumbent or dorsal posture, and four in the dorsal posture. Following out this subject of posture we come to the position of the head in relation to the trunk. To quote Dr. Hewitt's own words: It is a common practice for the head to be thrown well backwards upon the trunk in order to allow of the extraction of the upper teeth. This procedure has the double effect of bringing the base of the tongue and epiglotis away from the pharynx and larynx respectively, so that the act of swallowing is rendered difficult or impossible.

The act of swallowing is of importance in anæsthetics for it has the double effect of temporarily closing the larynx against an irritant, and of carrying away any solid or liquid substances from dangerous proximity to the laryngeal aperture. In dental operations under chloroform there is a great tendency for the act of deglutition to arise. In the first place the anæsthetic is usually not very profound and, secondly, blood, saliva, mucus and fragments of teeth are generally present as exciting causes, and, thirdly, the position of the patient's head is such that these substances tend to gravitate back towards the throat. I can imagine nothing more likely to bring about asphyxical complications under chloroform than placing a patient in a semi-recumbent position on a sofa, the head being well extended over the sloping end. We have also to guard against the opposite extreme, viz., the flexion of the head on the sternum, which is very apt to occur from the position necessary to the extraction of lower teeth, and the too wide opening of the mouth by gags, etc. This, if the shoulders are not also raised, will tend to force the tongue to touch the pharyngeal wall and so impede respiration.

This impediment in respiration, however produced, is far more likely to produce a fatal effect in chloroform administration than in æther or nitrous oxide, the arterial blood pressure being so much less.

We are thus brought face to face with two facts (1) The much greater percentage of deaths from chloroform in dental cases than any other anæsthetic. (2) The fact that the posture most favourable for the performance of the dental operation is the most unfavourable for the administration of the drug.

In consequence of these facts many of the leading men in London refuse to operate under chloroform. There it is not a matter of much moment, for men specially devoting themselves to the study of anæsthetics are ready to give whatever anæsthetic the dentist prefers. In the country matters stand rather differently. Should a patient require a general anæsthetic other than NO_2 it is, I take it, the correct thing to ask their medical attendant to give the anæsthetic, and should he come prepared to give chloroform, it is a difficult matter, at the last moment, after all arrangements have been made and the patient has been worked up to the highest pitch of nervousness, to refuse to perform the operation. Fortunately, I have had little to grumble at personally, for the medical attendant has either chosen æther or A.C.E. which, according to statistics, is not nearly so dangerous as chloroform given alone.

It is not for me, gentlemen, to dictate as to the best methods of meeting difficulties which may arise during the administration of chloroform, for the remedies tried when it is given in operations in general surgery are equally applicable to dental operations, and you are far more versed in such matters than I. There are points, however, Iwould urge: (1) The necessity of the dorsal position, with the head as much as possible in line with the body; (2) The advisability, where possible, of performing the operation at the patient's house. From the point of view of the dentist, granting the recumbent position is necessary, it is as easy to operate on a couch in the patient's house as anywhere else. From the patient's point of view it has many obvious advantages, and where possible I think it only right to put them within his reach.

To vere round to still another subject I should like to call your attention to the severe constitutional symptoms that sometimes accompany an ordinary alveolar abscess. Of course, an alveolar abscess, if neglected, may burrow and involve structures that endanger the patient's life, but it is not of such cases that I am speaking. A case that came under my notice will illustrate my meaning.

A patient came to my house one evening, complaining of great tenderness, and pain in a right upper molar. He also complained of severe headache, general malaise, and said he had had several shivering fits. The offending tooth contained a large filling, and thinking that the pulp had probably died under this, and was causing an alveolar abscess, I drilled into the pulp chamber, hoping to possibly drain off some pus: no pus however came; so, leaving the cavity open, and having applied linimentum iodi to the gum, I sent the patient home. That evening he took his own temperature, and found it, he said, over 100°. He had previously suffered two or three times from influenza, and from his symptoms he concluded he was commencing with a fresh attack. The following morning he sent for his doctor, who likewise diagnosed influenza, considering the toothache a mere concomitant. The patient was kept in bed all that day, the toothache persisting, and his general condition getting worse rather than better. On the morrow, in spite of the offending tooth being an important one, I took it out, and as I removed it there flowed from the palatine socket a quantity of thick pus. That evening the patient's condition was vastly improved and his temperature nearly normal. The following day he was at business. In my own mind I have little doubt the patient was suffering not from influenza at all, but, being in a debilitated condition, the constitutional symptoms consequent on the formation of pus were more than ordinarily severe.

Reports of Societies.

LIVERPOOL DISTRICT ODONTOLOGICAL SOCIETY.

ANNUAL MEETING.

THE Annual Meeting was held in the Medical Institution, Mount Pleasant, on Tuesday, April 27th, 1897. There was a fair attendance of Members.

The PRESIDENT (Dr. Waite) was in the Chair, and gave expression to a few well chosen and encouraging words in reference to the Society, urging the Members to take an increased interest in its well being, especially pointing out the importance of well attended meetings.

The PRESIDENT announced that at the previous Council Meeting it was felt that as the Society had been such a short time in existence, it was well not to make any change this year in the officers. This was confirmed by the meeting, and the list of officers for the Session 1897-98 will remain as follows :—

President :—W. H. Waite, L.D.S.I., D.D.S. *Vice-President* :—J. S. Dickin, L.D.S.I. *Hon. Treas.* :—E. J. M. Phillips, M.R.C.S., L.R.C.P., L.D.S. Eng. *Hon. Librarian* :—L. J. Osborn, L.D.S., Eng. *Council* :—R. H. Bates, L.D.S. Eng. ; E. A. Council, L.D.S. Eng. R. Edwards, M.R.C.S., L.D.S. Eng. ; W. Hargrave, L.D.S.I. ; T. Mansell, L.D.S. Edin. ; F. Rose, L.D.S. Eng. *Hon. Secretary* :—J. A. Woods, L.D.S., Eng.

The Hon. Sec. was then called upon to read his report, which was as follows :—

The first annual report of any society should contain some outline of its origin, and some hint of the objects for which it has been called into existence ; professional spirit is a vital principle, it grows and spreads, and in a while it bears fruit ; desire for intercourse, for a free exchange of opinion and experience in matters of mutual interest, these are among the first fruits of the professional spirit.

Selfishness keeps men asunder, but selfishness is ignorance. Education, culture, a clear insight, and a wide outlook tend to draw men together in a generous emulation for the good of the whole, because by this way comes the most certain and permanent good of every part. Animated by this desire, some of the younger practitioners in the district exerted themselves to bring about the formation of this society, which was organised on Friday, December 6th, 1895, commencing its career with about 50 members. In the early months of 1896, meetings were held and papers given as follows: by Mr. Rose, on "Choice of Materials; *(a)* in the Surgery; *(b)* in the Laboratory." By Mr. Pidgeon, on "Hints and Queries." In April, a reception was held at the Adelphi Hotel, when the members and friends of the society, together with their ladies, were entertained by our genial President, who delivered an address and the proceedings were enlivened by some excellent music.

Our first session proper began in October last, when, at the first meeting Professor Paul delivered a lecture on "Some Points of Interest in Dental Histology—The Enamel Organ." It would be impossible to describe this lecture justly, it was throughout marked by scrupulous care and modesty, while at the same time it bristled with ideas and facts indicative of laborious research and painstaking investigation. Some of the Professor's views were original and somewhat striking, and it is gratifying to notice that these views have since been mostly endorsed by Mr. C. S. Tomes and Mr. J. Howard Mummery. This fact at once elevates Professor Paul to the front rank of authority on the subject of dental histology. His lecture was profusely illustrated by lantern slides and microphotographs, as well as by a number of actual specimens exposed to view in several microscopes, specially arranged for the convenience of those present. Though the subject of this lecture was far above the ordinary range, it was made so interesting and intelligible as to excite a very full and fair discussion, in which several members took part. In November Mr. R. Edwards gave us a paper on "Pain," the literary character of which was masterly so far as the scope of the paper led. Some disappointment was felt, however, that the scope was limited, and did not embrace so much of the practical dental aspect of the subject as might have been acceptable, and no doubt, having so whetted our appetites, Mr. Edwards intends to give us a more satisfying repast at an early date. The January meeting found us honoured by a visit from Mr. Dall, who journeyed from Glasgow in order to afford us an opportunity of becoming acquainted with his varied and ingenious and skilful adaptation of "Porcelain and Glass Inlays." This is, indeed, a hobby with Mr. Dall, and he rides it with such dexterity and daring as to call forth the admiration and wonder of all beholders, and this even when they cannot entirely follow the utility of some of his feats. The paper was so full, and so beautifully illustrated by slides and specimens of such variety and difficulty as to compel the unanimous recognition and applause of all present. Mr. Dall is the apostle of this kind of conservative work, and his enthusiasm is infectious, while his generous and lucid explanations are full of suggestion and helpfulness.

Our esteemed Vice-President held the fort in February, and gave a highly interesting and comprehensive account of the uses of "Electricity in Dentistry." He introduced us to the marvels of cataphoresis—for marvels they are—and as we listened we could scarce refrain from exclaimining, "What next?" Mr. Dickin is a past master in the subject, and his paper and experiments evoked a very warm appreciation. The last meeting for the session afforded a treat to those who attended, in the shape of a capital paper by Dr. Gemmell, on the "Relation of Medicine to Dentistry." The doctor's theory as to the true cause of dental caries, in which he claims supremacy for vital as against chemical or mechanical causes, did not, we are glad to say, go down. Fortunately, there were others present who had studied the subject from a dental point of view, and these soon controverted some of the opinions advanced by the essayist; still, the paper was admirably conceived and most carefully prepared, displaying an amount of earnest and active labour which was highly applauded by our members, and the discussion was probably the best and most vigorous of any we have had. Should Dr. Gemmell be so good-natured as to favour us at some future time, he may count upon a much larger audience, though he need hardly expect a more appreciative one.

At each meeting we have enjoyed the privilege of comparing notes on sundry "Casual Communications" brought forward by members, according to the custom of kindred societies. This department has shown a fair amount of fertility during the year, and will doubtless be more prolific as time goes on.

On review of the period, your Council congratulate you on the success attained so far. They have but one note of regret which they feel obliged to sound at this time, viz., that some of the members do not appear to have awaked to the value and interest offered to them by our meetings. The attendance has been disappointing in proportion to our numbers, and when gentlemen like Professor Paul and Mr. Dall are willing to spend time and thought, and labour and money, in preparing and delivering instructive addresses, the smallest return we can make for their trouble is that we show by our presence that we are thankful there are some unselfish souls left in the world who are seeking the good of mankind.

This Society will now go into recess for six months, and the Secretary will be pleased to receive promises of assistance, either in the form of Papers or Casual Communications, to be brought forward during next Session.

In the exercise of their function, the Council have thought it wise to recommend that the Executive remain unchanged for another year, and if this recommendation meets your approval, there will be no further business this evening beyond the adoption of this and the Hon. Treasurer's report.

Dr. WAITE proposed and Mr. HARGRAVE seconded, and it was carried unanimously: "That the Hon.-Secretary's and the Hon.-Treasurer's reports be adopted, and that they be printed."

Dr. WAITE proposed and Mr. DICKIN seconded, and it was carried by acclamation: "That the Members of the Liverpool District Odontological Society, in Annual Meeting assembled, desire to tender their unanimous and very earnest thanks to the Council and Officers of the Liverpool Medical Institution for the generous manner in which they have granted the free use of their rooms for the meetings of the society during the last session."

After short discussion, with reference to formation of a library, the meeting closed with a few formal votes of thanks.

To DUPLICATE MODELS AND IMPRESSIONS.—Take printers' roller composition, melt in a water bath until dissolved. Grease the model slightly with lard, and place it the same as if to mould a metal die, cover with a metal ring (a tin can opened at both ends will do), and pour the melted composition over the model. Let this stand over night. By morning the material is hardened and the model can be withdrawn. The composition being elastic it retains its shape, and a hundred models may be poured if necessary. Printers' ink rolls are made from glue and molasses.

THE DENTAL RECORD, LONDON: OCT. 1, 1897.

EDENTULOUS PAUPERS.

THE ways of guardians of the poor are often peculiar. Their duties are certainly difficult and their critics perhaps hypercritical. But whilst, on the one hand, few right-minded people care to see poverty—the result of misfortune—penalised, most also feel that if the condition of life of the pauper be made too easy, many, whose poverty would be better described as laziness, will prefer being kept at their neighbours' expense to earning their own living. It has always seemed to us a matter for regret that the laws of this country do not distinguish between these two classes of paupers. For if we consider only the care of the teeth of the poor, we feel that in criticising the action, or rather want of action, of the guardians in this matter, we should like to know whether we are asking for gratuitous help for the deserving pauper—if the expression may be allowed—or for the lazy man able to work, but either unwilling to do so or unable by reason of his vices—most frequently drink. It has several times fallen to our lot to note with surprise the refusal of guardians to provide dentures for the paupers under their charge, and in this issue we mention, elsewhere, the action of the Aston guardians in refusing to repair the denture of an inmate of the asylum. We say "surprise," and for two reasons. First, to refuse teeth to a pauper is really to inflict punishment on him, and this, though an accepted doctrine in the days of "Oliver Twist," is not now held to be the duty of a guardian. The chairman of the Aston Board said "he certainly could not do without his own artificial teeth"; meaning, we suppose, that his existence would be so wretched without them that their loss would be a real punishment. Yet he hesitated not to punish the pauper, giving as his sole reason the conundrum "if they granted one application how many more would they have?" Not being good at riddles we readily "give this one up," and whilst waiting for the answer, which we hope the chairman knows, would suggest that to be frightened out of doing right by a suppositious bogey suggests some lack of moral stamina. For if the applications became so numerous as to constitute a serious financial drain, then is the time to consider the matter and to see if expenditure in this, a good direction, cannot be compensated for by economy in another, for instance, by ceasing to pamper some of the too numerous able-bodied paupers. But we are surprised for a second reason. Surely it is true economy to keep the inmates of an asylum in as healthy a condition as is possible. It must surely be more costly to maintain an inmate in the infirmary than in the workhouse, and without teeth it is impossible to remain healthy. They have been aptly described by Sir James Crichton Browne as "the first line of defence." It is possible to maintain existence when this has been demolished and neglected; but it is risky and does not commend itself as a common-sense proceeding. The British Dental Association have done service in urging the care of children's teeth, here is another good fight we would commend to their valour.

News and Notes.

At a meeting of the Aston Guardians, on September 12th, in the report of the House Committee submitted there was an application from an inmate who had broken his false teeth. He asked that the cost of repairing them might be granted. Mr. Price recommended that the application should be granted. The cost would only be about a guinea. Mr. Cooke seconded. Mr. S. Doggett moved as an amendment, and Mr. Hunt seconded, that the application should be refused. Mr. Price pointed out that the man had had the teeth about 18 years, and now that they were broken he was really worse off than if he had never had them. The

Chairman said he certainly could not do without his own artificial teeth, but the question was, if they granted one application how many more should they have? He thought it would be better to let the matter remain in abeyance for the present. On a vote being taken, the resolution of Mr. Price was lost by eight votes to five.

Dr. MARCUS GLANVILLE writes to the *Lancet*:—"I had recently occasion to take a child, aged 11 years, to a dentist for the removal of a tooth. Gas was administered, and the child returned home apparently all right. The next morning the mother called on me and stated that the child had passed a rather restless night, and had some slight difficulty in swallowing, but did not seem feverish. I made a visit in the evening and examined the child's mouth. The wound in the gum was healthy, but there was a small, yellowish patch on the left tonsil which I had no hesitation in pronouncing to be diphtheria. On inquiry I elicited that the patient had felt her throat a little 'sore' on the night previous to her having the tooth out. I called on the dentist and warned him of the case. Had this patient diphtheria at the time of her visit to the dentist? If so, then one can see what a potent source of infection the forceps, mask, tumbler, &c., can become, more especially in the case of children, unless they are thoroughly sterilised after each operation, and it is with the intention of putting dentists on their guard that I send notes of the case. I have just heard that the child has died in hospital from paralysis."

"AN erratic dentist," says the *Dominion Dental Journal*, "who occasionally honours Montreal by a professional tour of a few months, in the intervals of waiting for the more congenial opening on the stage, is very absent-minded. His mind is always pre-occupied with the writings of the dramatists, and his conversation is interlarded with quotations from various playwrights. It was not uncommon for him to suspend an operation, and while the rubber dam was in place, hurl forth lengthy extracts from Shakespeare, until re-called to his work. One day he was taking an impression in compound for a partial upper set, and instructing the patient not to disturb it, he went into his laboratory, where he found a friend who proposed that they should go out and 'see a man.' Forgetting all about the patient out they went. The patient got a book, and though he thought it was rather a long wait, in his innocence of the business he decided to keep cool, so he sat in the chair for two hours, with the impression cup protruding from his mouth. Our dramatic genius was in the middle of a game of poker when he suddenly thought of the patient, and going to the telephone he rang up his office. 'Is that you, Jack? I left old ——— in the chair with an impression in his mouth; tell him it is a new idea; one of my own inventions; only known in my parlours, and you might take it out, Jack, and tell him to call in the morning.'"

REFERRING to the recent deaths during chloroform administration, which we have already reported, the *Lancet* writes:—"The most cogent adverse reason to the use of chloroform in such cases is the extremely high mortality which reference to the report of the *Lancet* Commission appointed to investigate the subject of the Administration of Chloroform and other Anæsthetics from a Clinical Standpoint, in 1893, shows only too plainly. We cannot agree with any statement that chloroform in dental operations is as safe as ether or the A.C.E. mixture. It is a very great question whether it is wise to attempt to remove 27 teeth at one sitting; but if cases do arise in which such an heroic proceeding is considered justifiable, then certainly ether or a mixture should be used rather than chloroform. The only way in which the last-named anæsthetic can be at all safely employed in dental surgery is where the patient is placed under the same conditions as if he or she were about to undergo a major surgical operation. This cannot be done in the ordinary routine work of the dental surgery. The patient must be prepared by abstention from heavy food, must have all clothing absolutely removed and replaced by a dressing-gown, and must be placed in the recumbent position. We cannot but feel that for so comparatively trifling a matter as having teeth out no one's life should be jeopardised by the use of chloroform unless the fullest precautions are taken and the risk looked clearly in the face. Many country dentists may point to a large experience of chloroform without mishaps, but their fortunate cases cannot counter-balance or lessen the horror of a fatality such as that at Rhyl. We cannot speak too emphatically."

BRITISH DENTAL ASSOCIATION.

Microscopical Section.

The Microscopical Section held its meeting on Wednesday, August 18th, in the Anatomical Theatre, Trinity College, Dublin, Dr. A. W. A. Baker, the President, occupying the chair.

Presidential Address.

The President delivered the following Presidential Address:—Gentlemen, my first and most pleasing duty is to thank you most sincerely for your kindness and goodwill in electing me your President—for certainly were merit the test there are many members of the Association who have a much greater claim to the honour than I have. But since you have placed me in that position I shall endeavour to discharge its attendant duties to the best of my ability, and I trust to your satisfaction.

As there are many valuable communications on our Agenda paper, I think I shall best consult the interests of the section by making my remarks as brief as possible. You are doubtless familiar with the gradual growth of our section from the excellent sketch of its history given by Mr. Mummery, one of our former Presidents, so it is unnecessary for me to travel over the same ground, and presuming that you know all about it I shall take the microscopic section as it exists.

The Committee of the Irish Branch, who were entrusted with making the necessary arrangements for the Dublin Meeting of 1897, in giving a special prominence to the Microscopic Section—in fact in incorporating it as an essential part of our annual meeting—have doubtless incurred the censure of some members of the Association. These members most likely think that microscopists are perhaps on the whole a harmless body of enthusiasts, and that they have a fair right to pursue their facts, if they choose, but that they can scarcely claim the right to take a prominent part in such an eminently practical assembly as the annual meeting of the British Dental Association.

I do not fancy that it requires any very abstruse arguments to show that this view is an erroneous and superficial one, and can only be held by persons who have not taken the trouble of reflecting how very much the dental art has been, and must of necessity be, indebted to the microscope.

I think it is a happy and natural coincidence that at a meeting of our Association, held in Trinity College, Dublin, a great centre of Medical Education, the importance of the microscope should receive its due recognition as a means of acquiring that information upon which the scientific practice of our profession rests. And I trust, now that our section has emerged from the obscurity of its infantile existence, we may look forward to a long career of its usefulness, not only to the British Dental Association but to the profession at large.

One is apt to accept the facts of everyday life as they occur, and to forget the process by which we arrived at them ; so in our daily practice we scarcely realize how much we are indebted to the microscope for methods of work which have become matters of routine. Were it not for the very important aid which the microscope has rendered to the healing art of which we are a very essential part, we should still be fast bound in the meshes of empiricism. We should still be ignorant of the structure of those tissues with which it is our constant lot to deal ; our knowledge of anatomy would be bounded by the possibilities of the unaided eye; our ideas on pathology would be crude and vague, the true nature of Dental cases a mystery. Were it not for the development of bacteriology our treatment of septic root canals would probably not be attempted at all, or a successful result would be a matter of the merest chance, and so we should be without the sure foundation upon which we have built our useful and artistic crown work, which rightly used is among our best services to our patients.

The microscope, then, has been the means by which the edifice of the dental art of to-day rests no longer on empiricism, but on a sure and scientific basis. And with its assistance not only do we learn the important truths of anatomy and pathology, but in the course of the study which it involves we cultivate a scientific habit of mind in observing facts and drawing deductions from them which is in itself an important part of our education, and which helps us to a considerable extent to deal intelligently with the problems which confront us in our work. There is also an aspect of microscopic work which has an important bearing for us as Dentists—I refer to microscopic technique; were it for this reason alone the work done in connection with the microscope will prove invaluable, for in the delicate manipulations incidental to preparing and mounting specimens, one acquires a lightness and steadiness of touch that no other scientific pursuit with which I am acquainted will give; need I point out to this assembly how very desirable such delicacy of hand is in operations within the mouth and how very materially it conduces to successful practice?

Among the many interesting communications to this section we hope to show this morning some of the beautiful transparencies which illustrated Dr. Leon Williams' paper on "Enamel," and with which most of you are doubtless familiar, owing to its publication in the *Dental Cosmos*. The practical importance of this paper, taken in conjunction with the researches on the chemistry of enamel by Mr. Tomes and Dr. Black, can scarcely be over estimated.

Many of the pet ideas to which we have been fondly clinging for years must give way before the truths contained in these communications. Most of us, no doubt, have held views as to the different treatment of hard and soft teeth, and perhaps have talked glibly enough about it. Old superstitions die hard; but they must disappear before facts. Hard and soft teeth have no existence as such. If we would be exact in our terms we must adopt Dr. Black's suggestion, and speak of softened teeth, that is those teeth where the solvent action of the caries has been at work almost imperceptibly on the enamel; such teeth require our greatest care to cut widely till we have sound enamel edges, to leave no fissure or slight defect of surface as a possible harbour for micro-organisms, in short, thoroughness must be our watchword if we would do our duty towards our patients; this thought was admirably expressed in an address given some years ago by my colleague who is now the President of the Association, when he said: "The dentist should emulate the faithfulness of the surgeon and fill a tooth as carefully as the latter would tie an artery."

The scientific habit of mind engendered by microscopic work is not likely to stop short at anatomical and pathogical investigation, so we find both Dr. Black and Mr. Tomes working at the properties of amalgam in endeavouring to find some clue to the causes which govern shrinkage. It will be quite evident to anyone following the work of these investigators that there are possibly many factors engaged in producing this defect, but as the subject is not yet completed it would be premature to express any very decided opinion as to the real cause, still these investigators have deduced some practical hints as to the best ways of using amalgam, of which we can all take advantage, I merely allude to this subject as an instance of the practical utility of scientific work.

Although our section is called the microscopic section, it really embraces all scientific work connected with dentistry, and no better example of such work is there than the paper which is to follow this address, I mean that contributed by the President of the Association. The application of the so called X Rays to dentistry will, I believe, prove a very important addition to our means of diagnosis, and its use in the mouth is more likely to be attended by success than in the other parts of the body, as the error produced by distortion is there considerably lessened. But I shall not further anticipate what you will better learn from Dr. Stack's paper and Dr. Haughton's demonstration.

In the remarks that I have made I have endeavoured to combat the idea that microscopic, or, to speak more generally, scientific work is a thing apart from our daily practice.

I trust that I have convinced you that such work is extremely necessary for our real progress, and I think it follows that those who work for our benefit are entitled to our gratitude. In my opinion that gratitude would find its most suitable expression in the establishment of a prize for original work to be given by the Association at our annual meeting. If precedent were wanting for such a course it will be found in our kindred Association, the British Medical, where a helping hand is extended to those who work for the common good.

Mr. STORER BENNETT, in proposing a vote of thanks to Dr. Baker for his very able address, said that Dr. Baker, with the modesty that characterised him, said he did not know why he had been placed in the chair. Dr. Baker had shown them that morning the reason why. He had shown them many of the advantages that arose from having a scientific as well as a practical side to the Annual Meeting. Dr. Baker's address was a most practical and encouraging one, and one which would enable them to take away thoughts to dwell upon in the future, and to assist them in carrying out their work during the coming year.

Mr. J. J. ANDREW seconded the proposition, which was carried with acclamation.

A paper was then read by Dr. STACK entitled "A Contribution to the Prophylaxis of Dental Irregularities."

Mr. HARDING said the paper dealt with a very practical series of points with regard to the preservation of deciduous teeth, which was a matter that came before them daily. It required a good deal of persuasion on their part to make the parent of the child appreciate the immense importance of the preservation of the deciduous teeth. Dr. Stack had mentioned the point of advanced caries affecting absorption, and that was a point which should not be lost sight of. The unabsorbed roots of dead deciduous teeth had often such an immense influence of preventing the permanent teeth, that it required constant watchfulness to prevent the permanent teeth from being displaced when they were erupted.

Mr. J. J. ANDREW said they all knew the result of the little temporary teeth getting into a bad way, how, when they were dead, they interfered with the coming of the permanent teeth, and there was practically no absorption going on at all. Dr. Stack had shown them the result of that, and that the actual pressure which used to be supposed to cause absorption did, in the case of the dentine, have a very great effect. It was a point he himself had never noticed before. They all knew how easily a permanent tooth was driven out of its place by a dead tooth, and that showed the importance of trying to save the temporary teeth in a living condition.

Mr. J. HEADRIDGE asked Dr. Stack if he found any difference between the roots of temporary teeth which had died and been treated so that they had never become septic, and really septic roots that had never been treated—did he find the polished surface on both?

Dr. STACK said he was unable to answer the question.

Professor J. ALFRED SCOTT, M.D., F.R.C.S.I., exhibited a series of lantern slides illustrating a method of colouring lantern slides for scientific demonstrations.

Mr. CHARLES S. TOMES, F.R.S., M.R.C.S., L.D.S. Eng., in a paper on "Undescribed Forms of Enamel," said that the enamel of Lamna was not much like the tissue one was accustomed to see. In many sections the line of junction between it and the dentines was not so smooth and sharply defined as in most other cases. In almost all cases the surface of the dentine was not quite smooth, but it was pitted, as some thought, to receive the ends of the enamel prisms, and that pitting gave it, in section, a festooned appearance. In one instance of Lamna and other Selachian teeth that festooning was much deeper, so that the dwindling processes of the dentine, getting rapidly thinner, ran some distance into the enamel. Dr. Paul had suggested that the penetration of all tubular enamels by tubes of the dentine was only to be explained by incursions of the dentine matrix carrying with it the tubes. That explanation he (Mr. Tomes) could not accept, as the results of a very careful investigation of developing marsupial enamel, which he had lately communicated to the Royal Society, showed that it was not at all true of that enamel; and viewed in the light of those researches, he did not think it true exactly of those Selachian enamels, although the appearances lent it a *prima facie* support. Some little distance in the enamel—a fourth or a third of the way through—there occurred a layer of irregular spaces like interglobular or lacunal spaces, and the tubes continued from the dentine ran into those. They were further continued beyond them right out to the surface of the enamel, where they had open ends and the tubes were smallest in the middle of the enamel, tapering to that region from both sides. In watching the action of acids upon a ground section he had noticed that the dentine was attacked with even greater rapidity at first than the enamel, and with the evolution of a great number of bubbles of gas, though the enamel ultimately wholly disappeared, while the dentine matrix was, of course, left. Hence it was apparent that the salts of the dentine were far more rich in carbonates than were those of the enamel, though he had not yet been able to make any analyses of them respectively. The chief points to which he asked attention were :—The interdigitation of the enamel and the dentine, the occurrence of lacunal spaces in the enamel, the peculiar arrangement of the tube system.

The Chair was here vacated by the President of the Section and taken by Mr. Lloyd Williams.

A paper was read by Mr. F. J. **Bennett** "Concerning the Expansion and Closure of the Dentinal Tubes."

Mr. J. **Headridge** said the experiments seemed to have given results which one would expect. Mr. Bennett had put a body which would expand under water in a rigid tube and consequently it had to expand in any direction it could. With regard to the experiment with calcium carbonate and gelatine, there was in this case only a mixture of a body that would not expand (calcium carbonate) when it was wet, and gelatine, which would expand, and consequently the expansion of the mixture was less than the expansion of pure gelatine. He hardly thought very much was gained by the experiments, although they were very interesting.

Mr. STORER BENNETT thought Mr. Headeridge had scarcely grasped the original intention of his brother, which was, that as Dr. Miller had stated in his book that internal expansion was impossible, some series of experiments might be made to determine whether it was possible to obliterate a tube by internal expansion which would set the physical question at rest. Whether the experiments were a sufficient answer as to the production of the translucent zone or not was beside the question. With all deference to the last speaker, it had been shown, he thought, that internal expansion could be obtained.

Mr. HEADRIDGE said he did not understand that the experiment was made with the view of disproving Dr. Miller.

Mr. W. HERN thought the experiments were sufficiently conclusive of the physical question as to whether a complete closure of the tube could be obtained due to expansion. So far it supported the original contention that the transparency could be caused by swelling. There were two or three theories with regard to the transparent zone : one that there was complete calcification, and the other of the swelling of the tubes. He should like to ask Mr. Bennett whether he had found exposed dentine surfaces which had been undecayed, for instance, the dentine exposure in cases of erosion, any tendency to enlargement of the ends of the tubes or swelling at the ends of the tubes.

Mr. F. J. BENNETT said there were many grave questions of physics involved in the question of internal expansion. He did not think internal expansion was such an easy thing in all structures as one would imagine. With regard to Mr. Hern's remarks, he would not like to commit himself as to whether in old roots or eroded teeth, or in exposed surfaces of dentine free of caries, there was an enlargement of the tubes or a closure. He had undoubtedly seen it in some cases—a sort of beaded appearance, which Dr. Miller had also described. It had occurred to him (Mr. Bennett) as possible that the internal closure such as he had described might occur in the horny layer, and that was rather carried out by a skiagraph in his possession, in which there was a difference between the layer and the normal dentine. They knew the X Rays to be opaque to lime salts, and therefore it was reasonable to suppose that if the lime salts were reduced in quantity there would be a less opposition. Therefore, if they assumed that the horny layer was less rich in lime salts than the normal, they would find it would be fainter in the picture under the X Rays. That was so in the skiagraph he had,

Mr. STORER BENNETT, F.R.C.S., L.R.C.P., L.D.S.Eng., read a paper on "A New Method of Staining Nerve Fibres in the Dental Pulp." He said that in the *British Medical Journal* of March 13th, an account was given, by Dr. W. Ford Robertson, of the result of staining medullated nerve fibres by Heller's method when the tissues had been previously hardened in a modification of Weiget's new chrome-alum-copper solution. The results seemed so promising that he was tempted to try the method on the dental pulp, and had placed under the microscope some sections prepared in that way. Weiget's chrome-alum-copper solution was composed of chrome-alum 2½ per cent., copper acetate 5 per cent., acetic acid 5 per cent., formalin 10 per cent. Dr. Robertson, however, pointed out that so large a proportion of formalin in the tissue prevented the subsequent staining being as perfect as it might be, and only used 2 per cent. He (Mr. Bennett) had experimented with the weaker solution. The tissue was hardened in the solution for 10 days, and when removed washed for some hours in water and cut in celloidin or by the ordinary freezing method. The sections were then stained by being placed in osmic acid 1 per cent. for half-an-hour (in the dark), then in pyrogallic acid 5 per cent., half-an-hour, next in potassium permanganate ¼ per cent., for from three to four minutes. The sections, of course, were carefully washed between each solution. They might then be dehydrated, cleared and mounted in Canada balsam, or at once mounted in Farrant's solution.

Mr. HOPEWELL SMITH thought Mr. Storer Bennett's paper was a very valuable one. There was no doubt the staining of the nerve fibres of the pulp had been a very difficult matter up to the present, but he should certainly adopt the new plan.

Mr. W. HERN said that in the small regions of the pulp chamber the histological conditions were very complex, and anything which enabled them to differentiate one part from the other was a great advantage, especially for students.

Mr. STORER BENNETT pointed out that his method did not stain non-medullated nerve fibres, but only medullated.

M. CHOQUET, D.E.D.P. (Paris), communicated a paper entitled "A Few Considerations on the Leptothrix Buccalis." He said that by the method of phenicated bouillons one could isolate in pure culture from the buccal cavity several species of leptothrix, differing from each other, either by their biological and morphological nature or by their chemical reactions. Among the numerous species which Leuwenhoeck was the first to discover in the saliva (though at that period the microscopic investigation was no easy matter), he had signalled the presence of a segmented thread of great length and without movement, or, rather, presenting an almost imperceptible oscillating motion. That was the Leptothrix Buccalis. At a much later date, Robin had studied that microbe, and had given a good description of it in a purely microscopic point of view. It was he who first attributed to it the genesis—the formation of the other microbes which were met with in the mouth, but bacteriology was a science of recent date, and until the contrary was proved, the leptothrix must be considered as a pure species. According to the definition of Professor Flügge the species which interested them belonged to the leptothricæted class and showed filaments with or without sheath, the division over which did not extend far, and of which the cells did not contain any sulphur. Those filaments were sometimes isolated, in other cases grouped in bunches, in tufts, entangled in each other, as one could see in examining certain advanced decays of which the walls were sometimes lined with those tufts. The direction of the filaments was not always straight ; it was even slightly waving. The leptothrix were easily stained by most staining agents. On attentive observation of certain species, spores in course of formation might be distinguished. The favourite abodes of the leptothrix were the dorsal surface of the tongue, the dental interstices and the amygdalian crypts, also sometimes in decayed teeth where it was met with in tufts in the margin or in the bottom of the cavity. It was also found, but by chance only, in the concretions of the lacrymal pipes, and in the expectorations of the pulmonary gangrene. Weigart had also met with it once in an abscess of the tongue. It was normally met with in the mouths of healthy persons, and very frequently in the mouths of idiots and weak minded persons. In this case the saliva was literally filled with it. It was also found in the buccal cavity of most animals. When met with in the human throat it was on the lateral surfaces of the tonsils, in the form of small yellowish spots, easily detachable by the platinum wire used for the inoculation. It would appear, according to Leber, that the leptothrix had a pathogenous action. In conclusion the author drew attention to the similitude of the colonies that three different sorts of microbes could be present which might be confounded with the leptothrix. Those were the Zopfü, the coli bacillus and typhic bacillus, but especially the zopfü. A simple examination with the microscope would suffice to avoid confusion, all the three simple bacilli not attaining the tenth part of the length of a filament of leptothrix.

The CHAIRMAN said they were deeply indebted to Dr. Choquet for an extremely interesting and important paper. It was only by studying the history of the organism and its mode of growth that they really could arrive at any true estimate of the part played by it in caries. With regard to the slides shown they were extremely interesting. It was very unusual to get true bony ancylosis in teeth. He thought he had only seen one example of it, and that was in Berlin. There was a very beautiful specimen thrown on the screen there from the mouth of a dog, in which the bony tissue came right up to the dentine without the intervention of cementum.

Mr. F. G. BENNETT said bony anchylosis was a large thing for some people to swallow, but he did not see any anatomical or pathological ground why it should not occur. He himself had quite an open mind on the subject.

Mr. STORER BENNETT thought they were deeply indebted to Dr. Choquet for the investigations he had made into the microbe organisms of the mouth, and for the trouble he had taken in bringing the paper before the Association.

Mr. LLOYD WILLIAMS said it would be within the recollection of some of the members that at the Birmingham Meeting in 1889 he showed a section of what was considered by those who examined it as true anchylosis. The case was very interesting because there was a very rare form of osteitis associated with the case.

The afternoon session of the Microscopical Section was devoted to lantern exhibitions.

Mr. W. S. Haughton, M. B., took two Röntgen photographs of abnormalites of the teeth, which he afterwards exhibited on the screen.

Dr. Leon Williams, exhibited, through Mr. Hopewell Smith. a series of slides illustrating the pathology of enamel.

A lantern exhibition was also given by Mr. Dencer Whittles of slides prepared by Dr. Creasy, of New York.

On the motion of the Chairman, a very hearty vote of thanks was passed to Dr. Haughton, Mr. Hayden, and Dr. Dickson for the assistance they had rendered to the Section.

On the motion of the Chairman seconded by Mr. Storer Bennett, Mr. J. J. Andrew was unanimously elected as President of the Section for 1899.

Abstracts and Selections.

ANCIENT METALLURGY.

By Henry Leffmann, M.D., D.D.S.

Although it is the main object of this society to discuss questions of actual dental practice, yet it has not been unwilling to turn its attention occasionally to theoretic subjects. The topic that I offer to-night is one that will not bear lengthy or frequent discussion, but it is not without interest, and to no specialists of medicine would it be so interesting as to dentists. Metallurgy forms a distinct feature of dental education. It is usually part of the title of some faculty-chair in dental colleges, and its history cannot be entirely without interest.

Every one who has any knowledge of the history of chemistry knows that at one period the efforts of investigators were largely directed towards producing the precious metals from cheaper sources, and especially from the so-called base metals. As in so many other cases, however, accurate information as to the aims and methods of the alchemists is not widespread, and it was partly with a view of bringing some trustworthy data before you that I offered this paper. A very brief review of some general historic questions will be appropriate as an introduction.

The origin of chemistry is lost in the obscurity of antiquity. Even the derivation and significance of the name have been subjects of dispute. The Greek form "chemeia" is first noted in a work of the fourth century of our era, although doubtless much older. It is now regarded as a Greek rendering of a name applied to Egypt; the word also means black, and various suggestions have been made concerning this. An eleventh century writer defined chemistry to be the art of preparing silver and gold.

Metallurgy must have been one of the earliest phases of chemic work. This would be expected *à priori*, and is shown by the allusions in the earliest records among various nations. The Hebrew scriptures are regarded as containing references to six metals—Au, Ag, Cu, Fe, Pb, and Sn. According to Pliny, the name metal (Gr. *met'alla*) is derived from the fact that they occur in association with others in veins, but other meanings are also given. The precious metals, gold and silver, which occur native, and have many striking properties, were in use at an early period, and there is evidence of the use of iron in Egypt in very early times. An incidental reference, showing the considerable antiquity of common metallurgic operations, is that in Proverbs xvii. 3: "The fining pot is for silver, and the furnace for gold: but the Lord trieth the hearts." The date is probably 500 B.C.

Positive evidence of the antiquity of the use of certain metals is obtained from the remains of ancient cities and temples. There has been so much successful digging during recent years that much of the hitherto accepted ancient history has been overthrown, and it is unwise to express positive opinions as to the details of ancient civilisation; but the following notes, collected from some recent authorities, and seemingly trustworthy, may be offered.

Schliemann found in one of the layers in the mound at Hissarlik, supposed to be remains of Homeric Troy, articles of gold and silver, a bar of pure copper, and shapeless masses of lead. Leaden objects are uncommon among Egyptian remains, but Diodorus states that sheet-lead was used in the hanging gardens of Babylon. The oldest coined money known is that of Lydia; it was an alloy of gold and silver. The Greek and Roman bronze coinage, from 500 B.C. to 50 B.C., contained from three to thirty per cent. of lead. This may have been put in to render the metal more fusible, but it may also have been a deliberate debasement by the government. References to lead occur in Homer and several other ancient writers. Mr. Eckfeldt, assayer at the United States mint at Philadelphia, has kindly given me a summary of the analyses of the Roman gold and silver coins in the mint collection. From this it appears that during the pagan period the coins were generally nearly pure metal.

In excavations at the site of the palace of Sargon, at Khorsabad, in 1854, votive tablets of different materials were found, to which a date of 700 B.C. is assigned. Four of these were examined by Berthelot ; one is nearly pure gold, one nearly pure silver, one an alloy of tin and copper, much oxidized, and one magnesium carbonate. Another ancient article, a fragment of a vase, from a similar source, was found to be nearly pure antimony. This fact is quite remarkable, because pure antimony is even to-day very rarely employed, though its alloys are common. A votive figure from the same place was found to be pure copper, oxidized, however, to considerable depth.

These isolated instances are sufficient to show how early metallurgic operations began. Before passing to the consideration of alchemy, I wish to call attention to a feature of ancient metallurgy that has little to do with dentistry, but will be interesting because new to many. I refer to the use of lead pipes. This was quite familiar to the Romans. Tons of lead pipe have been dug up in various parts of Italy, and it has also been found in other parts of Europe that were under Roman domination. This pipe was made by folding sheets and securing the junction either by running melted lead along it or by the use of cement. Very often the name of the property owner or of the plumber was imprinted on the sides of the pipe. Lanciani, the Italian archæologist, has described many of these inscriptions, and we learn, among other things, that women-plumbers were quite familiar to the ancient Romans. Such names as Julia Paula, Fabia Glycera, Aurelia Irene are among those given by Lanciani.

Vitruvius, a Roman writer on architecture, who lived about the beginning of the Christian era, refers to the danger of chronic lead-poisoning from water passing through lead pipes. I have a few lantern illustrations of Roman pipes and their applications.

Let us turn our attention to the special topic of alchemy.

Whatever may have been the aspirations and efforts of the ancient Greeks and Hebrews towards the transmutation of metals, they have left no definite evidence in their literature of efforts in such directions. The Jewish mind, in antiquity at least, was not scientific ; and the Greek mind failed to grasp the true scientific method ; in fact, the Greek philosophers disdained and condemned systematic observation and experiment. In later centuries works were written and fraudulently ascribed to noted ancient personages, such as Moses, Democrites, Hermes, Solomon, Alexander, or Cleopatra. Indeed it is very difficult to separate fact from fable and genuineness from fraud in this line of inquiry. As an example of this kind of apocryphal writing I will refer to a paragraph in a manuscript of the eleventh century, which is termed the "Diplosis of Moses"—that is a receipt originated by Moses for doubling the quantity of gold. A somewhat confused list is given, in which the words, copper, sulphur, arsenic, lead, and sandarach are mentioned, though there is a little uncertainty in some of the terms ; then a process of manipulation, which lasts for three days. We are then told that the added alloy will all be converted into gold, with, as the writer wisely adds, "the grace of God."

Within the past decade considerable accurate information concerning the alchemists has been brought into a readable form by the labours of the well-known French chemist, Berthelot. It had long been known that there are in some of the great European libraries Greek manuscripts on alchemy. Under the patronage of a department of the government of France, and assisted by various specialists in archæology and philology, Berthelot succeeded in sifting out much important matter from these writings and making *fac-similes* of some of the texts and illustrations.

The oldest of these manuscripts is now in the library at Leyden, in Holland. It is a papyrus, partly in Greek and partly in demotic character, found in a tomb at Thebes. It is believed to have been written in the third century of the Christian era, and is the oldest authentic manuscript of Egyptian alchemy. It is probably one of the few books that escaped the general destruction of books on alchemy and magic ordered by Diocletian about the close of the third century. It contains a long list of metallurgic receipts written in bad Greek, and is considered to be a sort of memorandum receipt-book of a metal-smith. The receipts show that a large part of the earlier alchemy was devoted to deliberate falsification. Manuscripts of later date, though still quite ancient, are also known. In these are found allusions to the relations between the planets and the known metals, also pictures of apparatus, and many mystical signs and obscure formulæ. I have had a few of these reproduced as lantern-slides, which will be shown later. The text of the oldest Leyden manuscript contains over one hundred receipts, from which a few may be taken as examples. Unfortunately the translation is not always positive. Names that seem familiar and intelligible to us may not have the significance that we assign to them. Thus, magnesia is now understood to mean magnesium oxide, but in ancient writings it often means an iron oxide, magnetic oxide (Fe_3O_4), or even some other dark mineral. Sal ammoniac now refers to ammonium chloride, but originally it was applied to another substance not definitely understood. The term "chalk" is used with reference to a form of clay used as a flux.

There is some prominence given to receipts for the manufacture of an alloy called "*asem*," which is sometimes made of copper, tin, and mercury, sometimes of tin and mercury alone, sometimes more complex. Here are some translations from the receipts:

"*Manufacture of Asem.*—Tin, twelve drachms; mercury, four drachms; Chio earth (a sort of clay), two drachms. Add the powdered earth to the melted tin, then the mercury, agitate with an iron rod and allow to cool."

"*Another Receipt for Asem.*—Take tin in small and soft pieces, four times refined, four parts; pure white copper, three parts; asem one part. Melt these and then purify the mass several times, and it is ready for use. It will be asem of the finest quality, which will deceive experts."

Here we have an evident intention to deceive by an alloy resembling silver.

Another receipt gives a method for augmenting gold—namely adding an alloy of copper and lead, with perhaps zinc, for some of the terms used are obscure.

You will all doubtless be interested in a receipt, written more than sixteen hundred years ago, for making gold-solder: "Gold, two parts; copper, one part; melt and granulate. If you wish a more brilliant colour, add a little silver."

It is not necessary to multiply details. The text of these receipts shows a merely empiric metallurgy. Here and there we note a mystical trend, which becomes more marked in later writers. The ancient conception that all matter originates from one form contributed towards a belief in transmution, and when motives of cupidity had led to the discovery of methods of imitating the precious metals by alloys which deceived even experts, it was no very great step to self-deception and the development of the futile search for the philosopher's stone.

An interesting feature of the early metallurgy was the supposed relation between the metals and the planets. We retain many traces of this to-day. Lead-poisoning is often called saturnine poisoning, silver nitrate is called *lunar caustic*, the preparations of iron are called martian preparations. By a chance, the number of moving stars visible to the naked eye is also the number of days in the quarterly period of the moon, and interesting usages have grown out of this coincidence, the discussion of which is not appropriate here. Various coincidences of a superficial character tended to connect the metals with the planets. The brightness of the sun accords with the rich brilliancy of gold ; a very ancient allusion to this is one of Pindar's odes. Similarly, the whiteness of silver corresponds to the paleness of the moon. The redness of Mars suggested iron, the bluish tint of Venus accorded with the lustre of the salts of copper. The dulness of the lustre of lead suggests a comparison with that of the planet Saturn. The assignments of Mercury, "the sparkling," and Jupiter, "the resplendent," have varied somewhat.

The list of relations between planets and metals has not always been as we now give it. In the earliest times certain alloys were regarded as distinct elements and classified as such. Thus, a natural alloy of gold and silver, called "electrum," and supposed to be a pure metal, was assigned to Jupiter. Tin was originally assigned to the planet Mercury, but later to Jupiter, when the metal, mercury, then called *hydrargyros*, was assigned to the innermost planet, to which its quick motion and sparkling lustre well suit it. Mercury was not known to the more ancient nations, but it appears to have been discovered about 300 B.C. It was at first regarded as a sort of allotropic silver, if I may use a modern term, and represented by a crescent reversed, silver having been represented by the crescent upright. The notion that the native alloy of gold and silver, called electrum, is an element is found as late as the sixth century, in the work of Olympiodorus. Concerning this alloy there arose the not unnatural view that it could be made to yield either gold or silver at will. At the present day such a property would at once be regarded as proof of the existence of the two metals in the mass, but in earlier times such an explanation would not be suggested. The precipitation of copper from its solutions by the action of iron was regarded as the conversion of iron into copper ; the small button of silver obtained by cupellation of lead-ores was regarded as a conversion of lead into silver. We know now that the silver is present in the original mass, but these ideas, which seem so simple and obvious to us, are matters of comparatively recent development.

The Egyptian alchemists regarded lead as the source of other metals, and as containing the transmuting agent ; indeed, the term which we now translate lead originally covered any metal or alloy that was white and fusible. It will not be necessary to follow this phase of the subject further, and I pass to some brief allusions to forms of apparatus.

Enjoying as we do at the present time the benefit of instruments of precision and methods of inquiry by which opaque materials are open to our examination, we cannot appreciate the difficulties of manipulation under which the earlier workers laboured. Even as late as the year 1777 we find Carl Wilhelm Scheele using pigs' bladders for collecting and studying the gases of the atmosphere.

The forms of apparatus that are figured in the alchemic manuscripts are principally those of distillation and crucible operations. Those that I will show on the screen are copies of Berthelot's *facsimiles* from a manuscript of the eleventh century now at Venice. There are inscriptions on various parts of the figures, and probably some of these were actually written on the apparatus, for these workers often mixed mysticism with practical ideas. Figures of similar apparatus are found in a fifteenth century manuscript now at Paris, and although there are some changes, yet we are still struck by the slowness with which progress was made when the lapse of four or five hundred years did not bring about complete abandonment of the older forms.

In regard to ancient metallurgic operations, it must be borne in mind that the ancients worked largely with mixtures of various ores, by which they obtained alloys at once, and under the views then generally received these alloys were regarded as single substances. We may smile at this : but when the nineteenth century began, chemists still regarded caustic soda as an elementary body. It will not be worth while to pursue this subject further, for it will become tedious. Indeed, I fear there has been already too much archæology and too little metallurgy. Before I pass to the lantern illustrations I wish to say a few words concerning the modern views as to the nature of alloys. Students often ask me if alloys are mixtures or compounds. If I pause to reflect before answering the question, the answers that float successively through my mind are: yes, no, both, neither, I do not know. The fact is that, until we can exactly define what we mean by mixture and combination, we cannot answer the question. We can, however, be sure that several different degrees of association exist in many alloys, and the probability is that most of them contain some of their constituent metals in a degree of association as close as we would expect in a combination, and this compound is mixed with the mass of the metal that is excess. For example, an alloy of ninety parts of silver and ten of copper probably consists of a compound of the two metals dissolved in—that is, mixed with—silver. It is, moreover, quite evident that the properties of many alloys are materially affected by slight impurities, among others, by the slight oxidation which almost all metals undergo when melted, and I think it is an interesting line of research open to the one who will prepare alloys of absolutely pure ingredients.—*International Journal.*

THIRD SET OF TEETH.

By S. B. Palmer, M.D.S., Syracuse, N.Y.

An extract from an article in the June, 1896, issue of the *International Dental Journal* reads as follows:—

"The Sunday *Herald*, of Syracuse, New York, reports a case at considerable length of one James Slattery, of that city, who has apparently erupted late in life a portion of the full denture, with the prospect of more teeth presenting in the near future. Dr. S. B. Palmer, of Syracuse, made an examination of the case. "This seems the best attested report of third dentition we have met with on record, and it is hoped Dr. Palmer will secure testimony as to the character of the set prior to becoming edentulous through advancing years. The dental profession has regarded a third set of teeth as a myth, and with some reason, as most of the so-called third sets have proved, on investigation, to be simply delayed dentition of the regular second set."

The history of this case, together with facts which came under my own observation, and statements from Mr. Slattery himself, also from an unmarried daughter who had her home with him, I believe establishes a case of third dentition beyond a doubt.

James Slattery was born in Ireland, in 1805. In 1832 he came to Napanee, Ontario, and two years later settled in Liverpool, near Syracuse, New York. He soon became a prominent salt manufacturer, owning his own plant. With the decadence of that once lucrative industry he, in 1867, removed to his farm and devoted himself to market-gardening. Mr. Slattery was a remarkably well-preserved man, and enjoyed robust health. When in his prime he was a well-developed man of six feet two inches, weighing two hundred and thirty pounds.

On mentioning the object of my call, I learned that he had carefully avoided notoriety, and had concealed the fact from his family as long as possible for fear that people would joke him about it, and would say that "Slattery was a baby and was just cutting his teeth." A moment's examination was convincing that the case was not a myth, and great care was taken in obtaining notes from which this report is a summary.

In the inferior maxilla were eight teeth located as follows : four incisors and two cuspidati, and two bicuspids on the right side. The cuspid on the left side and the second bicuspid on the right side were somewhat loose. The other teeth were firm, of usual size and length. They were somewhat overlapped from crowding. The colour suited the age, which I attributed to smoking. The teeth showed no wear, as teeth with the use of seventy-five or eighty years would have done, in holding a pipe. He showed how he could do it by placing his pipe in his mouth and pressing it against his gums above. He said he could not do that for twenty years owing to the loss of his teeth. On the left side, in place of the two posterior teeth ordinarily found, were three parts of teeth resembling roots, having grown up partially out of the gums. They were not firm or well-developed teeth. The man insisted that they also appeared within the time mentioned, two years previously, and that they belonged to the same set. I am satisfied that they were roots belonging to the second set, which had been covered by the gums or had escaped his notice until attention was called by the eruption of the teeth already mentioned. The other portions of the jaw showed no signs of further eruption of teeth, as considerable absorption had taken place.

An examination of the superior maxilla plainly showed that the third set, more numerous than those in the inferior, would soon make their appearance. The jaw was thick and full, nearly all the way back raising the lip and cheeks, giving the fulness peculiar to a child's jaw of six or seven years, or about the period of the eruption of the teeth of the permanent set. Mr. Slattery said his "jaws pained him very much ; that the new teeth pricked the gums like needles," and "there will be a full set, except where I had a tooth pulled. I never had but one pulled, and a piece of bone came out with it. Now there isn't any tooth coming in there at all ; that's the only vacancy, and that ain't sore." I examined the "vacancy" ; the depression was unusually deep owing to the growth of new process to support the incoming teeth. This closed the examination, and I intended to make another call in ten or twelve months.

Mr. Slattery died suddenly of disease of the heart, April 24th, 1896, a little over eight months from the examination. I did not learn of his death at the time, but made two calls upon the family, from which I gained the following information : Having requested his daughter to observe developments, I believe her statements correct. The superior maxilla became painful, and the teeth erupted nearly at the same time with wonderful rapidity, so that before his death the upper denture was complete, with the exception of the place where the tooth was extracted. I asked as to the colour of the teeth. She said they were yellow, much like the teeth of an old person. They were well developed. Soreness had abated and mastication was restored. I made enquiries respecting the teeth reported loose in the inferior maxilla. "They became firm like the others."

The *cause* of the crumbling away of the second set without severe pain, and that none were extracted save the one already mentioned, Mrs. Slattery could give no information.

That a man of robust health, and otherwise so well-preserved, should loose his teeth, and roots as well, calls for some constitutional change not usually met with. It could not be charged to pyorrhœa, because none of the teeth came out sound.

A patient whose teeth have been under my care for fourteen years or more are fast going in a like manner, giving little or no pain. He is a plumber, and has been for years engaged on soldering roofing and galvanized iron cornices, &c. He said the breathing of the fumes from muriate of zinc (soldering fluid) had destroyed his teeth. The case before us seems to bear upon the same principle and it is reasonable to suppose that the manner in which the roots came from the maxilla prepared the way for the conditions which followed.

Mr. Slattery was a salt manufacturer. For many years much of his labour was done in a "salt block." Evaporation was by boiling, and the warm vapour at times almost blinding. When not engaged in dipping salt from the boiling kettles, the packing of moist salt was performed in an atmosphere highly charged with chloride of sodium.

The suggestions as to the cause of the loss of the teeth, &c., are my own. The history of the case as obtained from the family, with my personal observations, convinces me that nature gave to Mr. Slattery a third set of teeth as above described."

USE OF X RAYS AS A DIAGNOSTIC HELP IN DENTAL SURGERY.

By E. Lenthall Oldfield.

I was consulted on June 24th by Miss M., who was suffering great pain in the left inferior maxilla. Her doctor in the country having unsuccessfully attempted to remove the third molar, referred her to her dentist in town. On examination, I found the third molar immovable, and advised her to have a skiagram taken; this was successfully accomplished by Dr. Clendinnen.

Armed with the correct diagnosis, the tooth was easily removed without an anæsthetic, and without sacrificing the contiguous second molar.

I understand that this is the first case recorded in the colonies in which the X rays have been used for dental diagnosis, and I must thank Dr. Clendinnen for his kind and very valuable assistance.

Dr. Clendinnen's method of taking the skiagram was as follows :—Three pieces of sensitised paper, each 1¾ in. × 2 in., were wrapped in non-actinic paper, and the whole enclosed in gutta-percha tissue, and sealed with chloroform. This pad was then moistened with patient's saliva, and placed in the mouth, just behind the angle of the jaw. The focus tube was placed externally at a distance of eight inches, the exposure lasting 10 minutes. Paraffin paper, which has less resistance, could be used instead of the gutta-percha tissue.—*Intercolonial Medical Journal of Australasia.*

NOTES ON THE ADMINISTRATION OF NITROUS OXIDE.

By J. Fredk. W. Silk, M.D.

That a certain amount of risk is attached to the inhalation of nitrous oxide is, of course, true, but judging from the records the danger to life is really remarkably small, not more, perhaps, even if as much as that attendant upon parturition.

Syncope is not unknown, but is not more frequent than in any other proceeding involving a certain degree of nervous tension ; its occasional occurrence, however, suggests the desirability of watching the circulation and keeping a finger upon the pulse, either in the temporal region or elsewhere. The chief difficulties and dangers, however, are of an asphyxial type. If the head is tilted too far back the tongue may fall over the glottis, or it may be pressed downwards by the operator's fingers. This may be remedied by lifting up the head from the occiput, or by forcibly pressing forward the mandible from the angles. Foreign bodies in the shape of teeth, portions of tartar, pieces of the mouth prop, &c., &c., may fall upon the base of the tongue, and, instead of being swallowed, as is usually the case, may slip into the larynx. Luckily, this is a rare accident, or, perhaps, one should say, that it is so carefully guarded against that it seldom leads to fatal results. The treatment is mainly preventive, but if by chance a foreign body has slipped down and is giving rise to asphyxial symptoms, the patient, presuming that he is in a dental chair, must first be pushed sharply forward and encouraged to cough by patting on the back, &c. As soon as possible the finger must be passed down to the glottis, when the offending foreign body may be felt and removed. Finally, recourse must be had to tracheotomy, or better, laryngo-tracheotomy. A certain amount of asphyxia is often produced by the trickling of blood into the larynx, especially after the extraction of upper molar teeth, and the possibility of this occurring points to the desirability of pushing the patient's body well forward as soon as possible, and of removing the mouth prop; for it is almost impossible for the patient to commence to swallow as long as the mouth is held widely open.

Occasionally the patient will groan, or will make more or less violent movements with his arms and legs during the stage of induction; these should only be restrained so far as to prevent injury to himself and others. Under these circumstances, and on the supposition that it is the result of some [unknown] air-leakage, I am myself in the habit of shutting off the valves, and so allowing the patient to breathe in and out of the bag, and at the same time pressing on the bag with my hand to force the gas through the face-piece. If this is done the trouble subsides in a few seconds. A more unpleasant *contretemps* of the same character is the almost maniacal condition which sometimes occurs in robust young men, directly the tooth has been removed and the patient commences to come round. This is almost invariably associated with recent alcoholism. No restraint whatever should be attempted in these cases; if the patient wishes to get out of the chair let him do so; to attempt to hold him will only lead, as I have seen it do, to violent scenes and personal injury to the bystanders. The condition only lasts for a few seconds.

Are there any cases in which nitrous oxide ought not to be administered? I know of but very few. The very frequent assurance of the patient that he has a "weak heart" is far too vague for any importance to be attached to it, and even in respect to definite organic heart lesions I should not hesitate much to give gas to a patient who was well enough to walk into the room without assistance. The same may be said, too, with regard to the phthisical, but these latter are apt to become unduly livid. I have certainly seen an epileptic fit occur during the administration of nitrous oxide, but this was probably a mere coincidence. I have seen nothing of the sort in the many other epileptics to whom I have administered, though a good many describe their subjective sensations as being very similar to the epileptic aura. Pregnancy? I have notes of a solitary case in which the administration was followed by premature delivery the following day, but the fœtus was macerated, and had obviously been dead for some time. Perhaps, on the whole, it would be wiser to advise against the administration in the eighth or ninth month. Very young children and even infants take gas well, but the fear inspired by the apparatus is probably greater than, and is an addition to, that of the operation, and I question whether is is wise to force it upon them.

Finally, a few words as to after-treatment. More or less, hysteria is not uncommon, and must be treated with firmness, the sedulous attentions of over-anxious friends must be discouraged, and the patient urged to help himself in every way. Sickness is not unknown, but is very rare, and if it occurs at all it will come on within a few minutes of recovery. As a rule, therefore, it does more harm than good to keep the patient recumbent for any length of time, as is so often advised by those who are not familiar with the gas; the general experience is that, on the average, the patient is quite fit to leave the house within a quarter of an hour or twenty minutes of the administration.

Just as it is unwise to administer nitrous oxide on a full meal, so it is better that no solid food be taken for an hour or so after.—*Treatment.*

A LITTER OF SUPERNUMERARY TEETH.

By G. Lenox Curtis, M.D.

A patient, aged 21 years, with a history of a full set of deciduous teeth and no extraction of the permanent set, presented herself, complaining of pain and some swelling in the jaw near the symphysis. Examination revealed the absence of the inferior left lateral incisor, the left central being slightly loose and tender on pressure. A slight space intervened between this and the cuspid, the cusp of which was tilted forward and the apex well back, encroaching upon the bicuspid. Suspecting an unerrupted lateral, a shell probe was passed through the gum and periosteum until a glistening subject resembling enamel was reached. The patient was so highly sensitive and hysterical that further examination was deferred until the time of operation. An incision in the gum was made directly over the tumor at the apex of the root, the periosteum was opened and laid aside so as to expose the contents. Here were found seven teeth nestling together in a cavity about the size of a denuded peanut. The roots were like the spokes of a wheel radiating outwards, some almost penetrating the gingival margin of the gum projecting above, while others were close to the lower border of the jaw. The cavity in which they were confined was perfectly smooth and without a soc. The roots of the teeth were pointed like tacks and were from one-sixteenth to a quarter of an inch in length. The crowns uniformly being an eighth. They closely resembled small inferior incisors of the temporary set. The crowns of only two showing clear enamel, the others being clump shape with a growth of yellowish colour much resembling exostosis. On opening the teeth I found they contained a pulp same as a normal tooth. This beats my record by four at a single birth. Around one of the largest teeth was a soc highly inflamed filled with fluid, and from this, no doubt, the trouble arose.—*Dominion Dental Journal.*

CUTTINGS FROM A PAPER BY B. S. SCOTT, D.D.S.

THE next class of remedies is what is known as obtundents, which professional usage has made to signify the blunting or deadening of sensation in hard tissue like the dentine. The term itself is a comparative term, and cannot be used in its strict sense as a synonym for anæsthesia or analgesia. It means a reduction or palliation of sensation, and not complete absence, yet an obtundent can be carried to the stage of analgesia. The current use of the word, however, is made to mean the application of agents for producing insensibility in the dentine. The action of obtundents has been based upon their ability to remove the protoplasmic fluid contained in the tubuli of the dentine to a depth not reached by the ordinary process of removing caries. This conception holds good at present with the exception of cataphoresis, which depends upon the osmotic action caused by the electric flow carrying the drug used into the substance of the tissue so that its specific work is done.

For obtunding sensitive dentine the mineral acids and their salts have long been used. Tannic acid, if sealed in the carious cavity for a few days, is said to produce good results; but probably this is due more to the removal of irritation by closure of the cavity than otherwise, though coagulation may take place to a sufficient depth to produce the desired effect.

"Zinc Chloride," where proximity to the pulp does not prevent, is useful, though usually painful. The crystal is the only form in which to apply it, allowing it to deliquesce in the cavity.

Absolute alcohol and chloroform by their affinity for water and their rapid evaporation have their place.

Warm air so long known is only mentioned for the purpose of citing a cheap but effective apparatus for furnishing it, viz., a copper coil in a vessel containing water, heated by a spirit lamp to the required temperature, and connected by rubber tubing with the foot bellows on the one end, and a fine nozzle to make direct application on the other.

"Citrate of Cocaine" is held to have superior qualities to hydrochlorate for this purpose, but it is to be sealed in the cavity for a few days, which makes its usefulness questionable.

Formaline and chloroform is a new combination, somewhat painful at the time applied, and doubtless owes its efficacy to rapid evaporation. Too long contact may produce a lesion of the pulp.

Cocaine in combination with thymol is thought to surpass an aqueous solution. Carbonate of Potassium with glycerine and carbolic acid, as recommended by Dr. C. S. Payne, meets the approval of more than one practitioner. Its action is claimed to be due to the abstraction of the water from the tubuli upon which the alkali enters them. If this be true, the coagulating effect of the carbolic acid would seem to be antagonistic. It produces more marked effects when dessication with alcohol and warm air has preceded it. It is sometimes painful when first applied. Its zone of insensibility is not very deep, but in most cases it is fairly reliable. Combined with essential oils it is less painful and less useful.

Carbolic acid and caustic potash, Robinson's remedy, has been once more brought into prominence, but is not as good as the alkali with glycerine.

Cataphoresis has been developed during the year, its uses and abuses better established, and while at present all that has been claimed for it has not been verified by experience yet it has come to stay, and in certain cases is the *sine quâ non* for obtunding.

Tin or aluminium filings, incorporated with oxyphosphate of zinc fillings, and subsequently burnished after the phosphate has been dissolved from between the particles, is much more durable in large cavities with frail walls than cement alone. The filling has the appearance of a metal filling, and the malleability of the metals by attrition but spreads the particles and unites them more solidly, preventing further solution of the cement.

Powdered tin mixed with collodion to the consistency of thick molasses, and applied to the surface of a dried cast before packing with rubber makes the inner surface of a plate smooth and hard as if vulcanized upon metal.

When vulcanizing put a small quantity of washing soda into the vulcanizer and the flasks will be kept clean, and the vulcanite in no way injured.—*Pacific Dental Journal.*

POLISHING INSTRUMENTS.—To keep instruments polished, use a material sold in wholesale jewellery houses under the name of diamantine ; the method of using is to place a small quantity of the powder on a piece of thick spongy sole leather and rub the instrument on it, when it will soon take on a fine polish. This so-called diamantine is nothing more nor less than oxide of zinc, and can be bought in a wholesale drug house much cheaper than anywhere else.

PULP PROTECTION.—Dr. William Storer Howe writes, in the *Dental Cosmos* :—" To protect the pulp from thermal shock or irritation, cut two small discs of rubber dam. Having the cavity dried ready for filling, touch the floor and walls with pure mastic varnish and apply one of the discs, on the other place a little soft cement, and with fine pointed pliers apply—cement down—on the first disc, spreading the cement under the disc with a ball burnisher."

FOR cementing on bands and crowns, dry the tooth and paint with shellac varnish before applying the cement. This will be found to give durable adhesion. Should the cement dissolve, the shellac will still protect the tooth and there will be no decay under the band. To retain regulating appliances add a very little powdered pumice to the varnish.—W. G. Lange, in *Cosmos*.

Resolutions passed by the National Association of Dental Faculties, St. Louis, U.S.A. :—

"Whereas death has taken from among us Dr. Francis Peabody, of Louisville, Ky., and whereas we feel that in his death the profession has sustained the loss of an able practitioner and teacher, therefore be it resolved, that we tender to his bereaved family our heartfelt sympathy, and that we cause the Resolutions to be entered upon the Minutes of this Association, and be it further resolved that a copy of these Resolutions be sent to the dental journals for publication."

"Whereas death has removed from our ranks Professor Frank Abbot, of New York, and whereas, on account of his social qualities, his genial companionship, and his ability as a practitioner and teacher of dentistry, we realise the great loss to the profession in his death, therefore, be it resolved, that we tender to his family the sincere sympathy of this Association, and request that these Resolutions be entered upon the Minutes of the Association ; and be it further resolved that a copy of these Resolutions be sent to the several dental journals of this country for publication."

CORRESPONDENCE.

[We do not hold ourselves responsible in any way for the opinions expressed by our correspondents.]

"FOR REFERENCE ONLY."

THE LIBRARY OF THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN

TO THE EDITOR OF THE "DENTAL RECORD."

SIR,—In the issue of the journal for this month under the Editorial Article "Read, Mark and Learn," the following paragraph appears :—"The library of the Odontological Society, *such as it is*, is unfortunately closed to dental students," Will you permit me to say that the writer of the article is misinformed as to the privileges extended to students?

If he will look to the outside page of each number of the "Transactions," for several years past, he will read the following:—"Visitors are admitted to the use of the library for reference only, on presenting a card of introduction from a member, but are not permitted to remove either books or pamphlets from the room."

I have put into italics the words *such as it is*, and as their meaning is hidden, perhaps the writer will explain them.

Yours faithfully,

THE LIBRARIAN.

September 18, 1897.

TO THE EDITOR OF THE "DENTAL RECORD."

DEAR SIR,—In your leader for last month it is stated "that none of the schools in the United Kingdom show any earnest desire to supply their students with a proper library." May I be permitted to say that, as far as Guy's Hospital Dental School is concerned, the statement does not apply. Ever since the formation of the School in 1889, not only has an earnest desire to form a proper Dental Library existed, but successful efforts have been made to give effect to it. The Dental Section has become a distinct feature of Guy's Hospital Library, and while every facility is afforded to students desiring to make use of it, a list, comprising most of the books on dental and allied subjects in the section, has been from time to time published in the "Guy's Hospital Gazette." By an arrangement that admirably conduces to the growth and efficiency of the Library, any student may enter in a book provided for the purpose the titles of such works as he may wish to see added to the Library; in no instance has the Library Committee declined to authorise the purchase of the dental books so recommended.

Yours faithfully,

THE LIBRARIAN,

Guy's Hospital.

THE DENTAL RECORD.

VOL. XVII. NOVEMBER 1st, 1897. No. 11.

Original Communications.

IMMEDIATE TORSION OF TEETH,

WITH NOTES OF CASES.

By W. H. DOLAMORE, L.R.C.P., M.R.C.S., L.D.S.

IN recording a few cases of "immediate torsion" of teeth, I do so with the full knowledge that there is little or nothing of novelty about the operation. At the same time such cases are, I hope, of some interest, for, if we may believe our text books, the operation is one at which many still look with suspicion, and which is scarcely regarded as a routine method of practice. Authors, indeed, seem either to condemn the procedure entirely or to damn it with faint praise. Thus Salter, 1874, writes :—"The sudden, forcible twisting of the tooth into its right position, by means of forceps, has been adopted in many of these cases with better results than could have been anticipated; but necrosis and loss of the tooth sometimes follow: and I think the proceeding scarcely justified when the same result can be accomplished safely by gradual pressure."

Coleman, 1881, says :—"Against such practice when first advocated we urged a protest, on the ground of injury likely to occur to vessels and nerves upon which the vitality of a tooth depends, and the results of that operation which have come under our notice have verified our predictions. We recently had to remove a necrosed upper right lateral tooth which had been thus rotated; yet the eminence of the operator was a guarantee that the operation had been most carefully performed. The tooth had never come down to the proper length and was very dark in colour; when it was removed it was found that the fang was more than half absorbed."

Tomes, in the two editions of his "Dental Surgery," 1887 and 1897, which I have at hand, deals at length with the methods of procedure, but concludes: "On the whole, the operation of immediate torsion is one which is only advisable when for some reason or other the rectification of position by means of plates is not available." Still he is "acquainted with one case only in which necrosis of the tooth ensued; the patient was a child of suitable age, but was a hospital patient, apparently not much tended by its parents, and probably no care was taken after the operation to preserve the tooth from movement. In this case, I believe, the pulp cavity was drilled into, through the lingual surface of the crown, and the root filled with cotton-wool steeped in carbolic acid. This treatment was perfectly successful, and the tooth, after a short time, became firmly fixed in its socket. I do not know through what distance the tooth was turned, nor whether it offered more than usual resistance, but the untoward result was attributed to the want of proper care exercised after the operation."

It may be noted that the "necrosis" spoken of here is purely of the pulp, and is quite a different thing to necrosis and loss of the tooth referred to by Salter and Coleman. To this point I wil return.

Smale and Colyer add to their description of the operation: "In spite of many successful cases having been recorded, it has not received the general approbation of the profession."

In the American "Text Book of Operative Dentistry," recently published, Goddard, who writes this section, expresses no very definite opinion on the operation, but says, *inter alia*, "The operation has been performed many times since then," *i.e.* its first mention in Tomes's "Dental Surgery," second edition, "and for older patients also, being preferred by some to the longer but less painful plan usually followed."

I have quoted these various opinions verbatim, because in them we find urged incidentally the various objections which can be brought against the operation.

First, the last mentioned writer alleges by inference that immediate torsion is more painful than the gradual methods. Is this so? We are dealing with an operation which is practically bloodless, so that even if one administration of nitrous oxide is insufficient a further inhalation can be given before consciousness is restored, and especially so if the anæthesia be one induced by nitrous oxide given with oxygen. In one of my cases Mr. Hilliard prolonged the anæsthesia for quite a sufficient period by continuing the administration of nitrous oxide, during the operation, by means of a nasal tube and a stopcock apparatus designed by himself. Seeing, then, that we have at hand a perfectly safe and not unpleasant anæsthetic, the operation itself is the reverse of painful, and, indeed, adjusting some of the fixed appliances, advocated for gradual treatment, can not be regarded as pleasant, or at least the expression on faces of those patients I have watched during the process does not suggest them to be. As regards the after treatment I can with confidence affirm that the advantage is all in favour of immediate torsion.

Secondly, there is a risk of causing death of the pulp. In those cases, which for this treatment may be regarded as ideal, namely, twisted central teeth of children of about ten years, the risk is small. Doubtless some minor arterioles are strangulated, some few nerve fibrils compressed; but they speedily recover or are replaced. In older children the risk is greater but is often found by results to have been over estimated. It would seem scarcely likely, considering the probable smallness of the apical foramen, that some obliteration of the lumen of the vessels should not occur, but apparently this is not usually sufficient to cause permanent occlusion. And I think we may neglect the nerves, for these would certainly recover any compression provided the circulation through the pulp be maintained. If torsion be performed in adults I would suggest that it does not seriously matter whether the pulp dies or not. There is a possibility it may not; I have heard it even alleged that the nutrition and sensation may be re-established after immediate re-implantation by men capable of observation and worthy of credence, who spoke from clinical experience. It does not appear impossible, and is certainly more likely to happen after an immediate torsion, where the risk of septicity around the apical foramen must be absent. But if the pulp dies is it of great moment? I readily admit the desirability of a live pulp, but it is apparently of little consequence in maintaining a tooth as a healthy member of the body, always provided we can perfectly protect the periosteum from septic influences. Nor should there be marked discolouration of the tooth, for it should be watched, and if there be signs of its death, then the pulp chamber should be opened up, and the blood, etc., thoroughly removed, before the blood pigments have permeated and stained the dentine; the cavity being filled with the whitest cement, this being covered then, or preferably later, by a gold filling. It has seemed to me that an unfair weight is given to death of the pulp under these or similar circumstances. Few of us can, I fancy, say with honesty that we have *never* exposed and destroyed a pulp needlessly during the excavation of decayed dentine. We recognise that "to fail is human," that however we perfect our art perfection is not attainable; that we cannot with certainty say when it is safe to leave a thin scale of softened dentine over the pulp and to leave this alive. We do our best and leave it in one case, not always perhaps with the best results, in others we expose the pulp and destroy it. We recognize this as a perfectly proper, possibly even the best method of practice, yet, if in such a procedure as immediate torsion the pulp dies, the operation is spoken of as a failure, even though in other respects the result be perfect. It appears to me to be an illogical position. So far as my experience goes death of the pulp due to immediate dislocation of teeth is perfectly painless. This we should expect. The pulp dies because the vessels are strangulated or torn at the time of the operation, consequently only a transient traumatic inflammation follows in the tissues *outside* the tooth.

Coleman speaks of having seen necrosis of the tooth, as a whole, follow this operation. We may accept it, therefore, that such a result may follow, but at any rate in his book we are not given details of these cases, and I have not been able to find these recorded elsewhere. Without these one could not discuss the reason why this should have occurred, but we know that there are several factors which might have been present. Twenty years ago it was not, perhaps, quite so fully appreciated as now that inflammation ending in necrosis or gangrene is usually of septic origin. It is possible that a septic pericementitis may have started by germs carried on the forceps, or carried by the forceps from around the neck of the tooth under the gum, or it may be that the pulp having died the cavity was not filled perfectly and at once. Prolonged dressing of the pulp cavity, which in these cases is almost necessarily aseptic, really means increasing the risk of its becoming septic; also many of the root-fillings then in vogue do not appear to us to be by any means ideal. The experience of most is that necrosis of the tooth does not occur if the operation and after treatment be carried out on antiseptic lines, nor does it seem to me that pathological teaching would lead us to expect it. It is possible that the necrosis in Coleman's case may have been due to fracture of the root of the tooth; this possibly being curved and not straight. I touch on this point again in my record of a case.

I have already mentioned the well known fact that the best time to perform the operation is at the age of about 10, *i.e.* when the root of the tooth has reached its full length, but when the apical foramen should be large, but it may be carried out in older patients and in adults it has the great advantage of being speedily completed. Adults will not, as a rule, wear, for any length of time, an apparatus visible in the front of the mouth, and in this operation such an apparatus need only remain a few days. Central incisors are the teeth which most readily lend themselves to this treatment, but laterals have been twisted, and there seems no apparent reason why canines should not be attempted. Both laterals and canines, are, however, far more prone to have crooked roots than are centrals, and a crooked root is naturally an absolute bar to successful torsion. In the Röentgen rays we have at hand a means of learning the shape of the roots which is of value. But in any case it seems to me that it is not wise to apply force beyond a certain degree. This amount it is not possible to state, but must be estimated from experience by comparison with the amount which was required in previous cases, and with that which we gradually learn to apply during the extraction of teeth.

With regard to the manner of performing the operation, I have little to add to the usual text book descriptions, but these do not, in my opinion, lay enough stress on the danger of the tooth jumping out of its socket. To prevent this I have been in the habit of fitting a piece of ordinary indiarubber between the blades of the forceps, cutting it a sufficient size to rest on the incisive edge of the tooth. When the forceps are pushed up to grasp the tooth, the pressure of the rubber effectually prevents the tooth coming down. It would be easy to design a pair of forceps with a stop to rest on the edge of the tooth; but the above method works well and obviates the need of a special instrument which, in private practice, would not often be used.

Figs. 1 and 2 represent the case of a little girl, aged nine, who came to the Dental Hospital of London. I determined to endeavour to straighten the two central incisors by immediate torsion. Mr. Powell, the dresser, took impressions for me, and, having cut off the teeth and refixed the same in a correct position in the plaster cast, made a vulcanite splint with a wire passing on the labial surface of the teeth. The patient did not attend again for three months, but I operated then under gas and ether. Ordinary straight bladed extraction forceps were used, and a piece of tape was passed over the incisor edge of the tooth, and, being seized at the cervical margin was supposed to prevent the teeth jumping out. However, it proved of insufficient value, for the left incisor shot slightly out of the socket, I pushed the tooth home and completed the torsion of both teeth and inserted the splint, She was instructed to attend in a couple of days, or rather the attendant—she was in an orphan home—was told to bring her. She did not attend again for six weeks, and then I found that she was not wearing the splint, having ceased to do so a week or so after the operation, but the teeth were in a good position (Fig. 2) and absolutely normal in colour ; but neither showed any decided reaction to the heat test. Mr. Powell took an impression.

It was the jumping out of this tooth which had led me in this and similar operations to use the indiarubber stop above referred to.

Fig. 3 represents the case of a girl, aged 13, who attended at the London Hospital. I decided to try immediate torsion, and took an impression. To the corrected model I made a galvanized wide Hammond splint, passing behind the bicuspids. This I could really have made to the mouth had I not wanted to keep a record of the case, and therefore took impressions. At a subsequent visit, under gas and ether, I twisted the tooth into its normal position, using a rubber stop and siezing the tooth first on its mesial and distal surfaces and then on its labial and lingual. When twisted the tooth was in a plane slightly anterior to its fellows. It will readily be noted that if the tooth, as shown in the figure, revolves around the centre of its long axis it must necessarily be in this anterior position. I therefore fixed the Hammond splint, which really fitted tightly without any ligatures, though I used one or two. I then took a piece of cane, ordinary polishing cane, which was at hand, and cutting a small wedge forced it between the labial surface of the tooth and the anterior bar of the splint. This forced the tooth quite into its correct position. The patient came again a fortnight later, and the tooth was absolutely normal in colour and position. I removed the splint and sent her to wash her mouth out, but through some misunderstanding she left the hospital and I was unable to take an impression as I had intended.

Fig. 4 is that of a girl, aged 11. About a week before attending at the Dental Hospital of London she had the upper canine on the left side extracted elsewhere, and had been advised to attend the hospital. It will be noted that the position of the tooth—at right angles to the normal—caused its incisive edge to come in contact with that of the lower teeth, so its eruption had been retarded to about half the normal extent. The space between the lateral and the other central was not wide enough for the tooth to stand in its normal position. An elastic band was therefore passed over the lateral incisor and thence backwards over the first and second bicuspids. There was some little difficulty in fixing this band, but Mr. Cribb, the house surgeon, kindly saw the patient several times for me and adjusted the band. An impression was taken and a retention plate made similar to that used in the first mentioned case. After wearing the band for a week, sufficient room had been gained for our purpose, so that under gas and ether I performed torsion in the same manner as that used in the last mentioned case. It was found that the tooth, being once in the normal position, it showed no tendency to twist out of it. Probably the lateral moved inwards again, in a measure, gripped the tooth. Therefore the retention plate was not used. I saw the patient a week later and found the tooth to be perfectly healthy and quite fixed in its new position. It was, of course, far too short, but there being now no impediment to its eruption, this may be expected to take place.

Since writing this note I have again seen the patient. In the interval (six months), it will be noted (Fig. 5), that the tooth has erupted to a considerable extent. It is, indeed, within one-sixteenth of an inch of its normal length. The colour of the tooth is good, and the tooth is quite firm and has not troubled the patient. There is no apparent reaction to the heat test, but this is by no means marked on the other teeth. It is evident now, by a swelling high up on the gum, that the canine extracted was a temporary one, the permanent is about to erupt, for which space must be gained.

The next case I wish to record is that of a girl, aged 16. Laterals with their slightly flattened roots and somewhat fragile structure are not so suited to this operation as are central teeth, moreover the patient is older than is desirable. But she was going, in the course of a couple of weeks, to a school abroad, and at a small place at which I knew no one to whom I could refer her. I therefore decided to attempt immediate torsion, giving no promise of success, suggesting, indeed, rather the contrary. A retention plate having been made and nitrous oxide administered, I endeavoured to turn the tooth, using the same precautions as in the last two cases. That the tooth moved somewhat I feel sure, but using such force as seemed to me justified, I was unable to get any real effect. It occurred to me that the osteoporosis which would possibly follow the injury might enable me to complete the operation, but an attempt on the following day was equally unsuccessful. I therefore abandoned the attempt, and arranged a fixed apparatus with elastic bands, but whether in the absence of a dental surgeon's help this will complete the torsion is very doubtful. It is a nice question as to whether I used sufficient force, I can only say that I used as much as in my other cases, but less than that which would be needed to extract such a tooth. Had it been a central tooth, or had I possessed a skiagraph, which it was impracticable to obtain at the time, showing that the root was straight, I should have used whatever force was needed to effect my object, feeling sure that my only danger was a dead nerve, and not thinking, as I have said, that this is of such real importance. The tooth was, however, not a central, but a lateral, and having no skiagraph I did not know whether the tooth was straight or not.

Fig. 6 represents the case of a boy, aged 13, who attended the London Hospital. I made a Hammond wire splint passing behind the premolars, which fitted so tightly as to remain fixed without ligatures. Gas having been administered in the usual way, I twisted the tooth, using the same precautions as in the previous cases. There was a good deal of difficulty in twisting the tooth to its right position, but eventually I succeeded in doing so. I fitted in the splint, which apparently held the tooth quite fast. Three days later the boy returned, having suffered but little inconvenience, but the tooth had rotated back again about half the distance, *i.e.*, through about 45 degrees. This was obviously owing to the splint not being efficient. I may say that I certainly prefer a splint which gets a better grip on the tooth than does a Hammond, but it will be readily understood at a general hospital one is inclined to hope that the easily made Hammond will suffice. However, I propose to leave the tooth a few weeks, and then to complete the torsion. It may be noted that when turning the tooth there was a check to torsion at the position the tooth has now assumed. It is obvious that the root is flattened, and that the bent socket has of its elasticity forced the tooth back to a position of rest. So soon after the operation, I did not feel justified iu taking an impression, and so cannot give an illustration showing the new position of the tooth.

ILLUSTRATIONS OF MR. W. H. DOLAMORE'S ARTICLE ON IMMEDIATE TORSION OF TEETH.

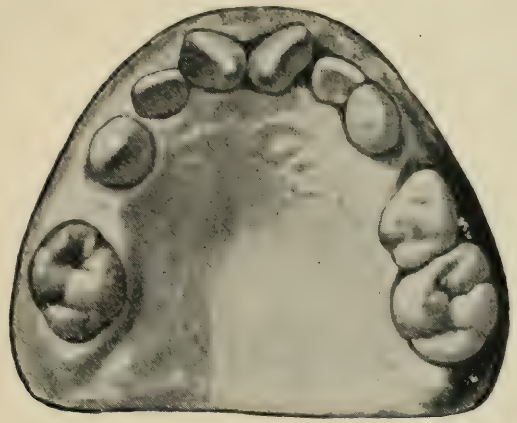


FIG. 1.

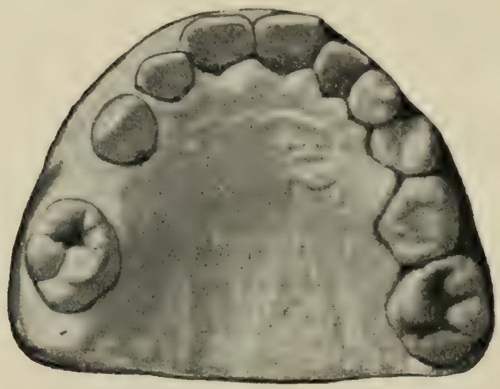


FIG. 2.

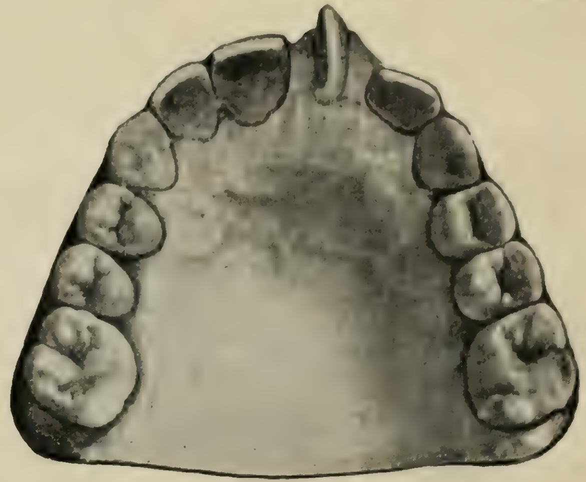


FIG. 3.

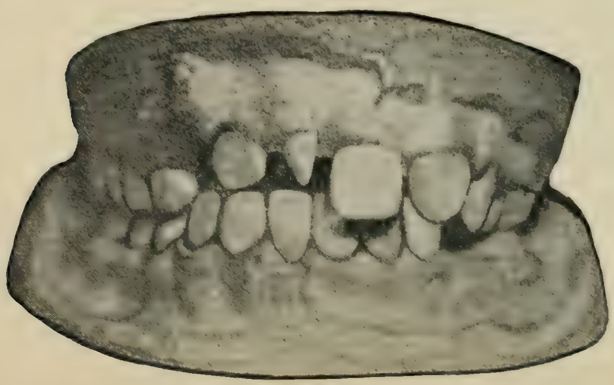


FIG. 4.

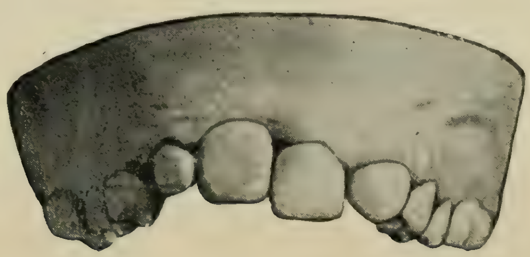


FIG. 5.

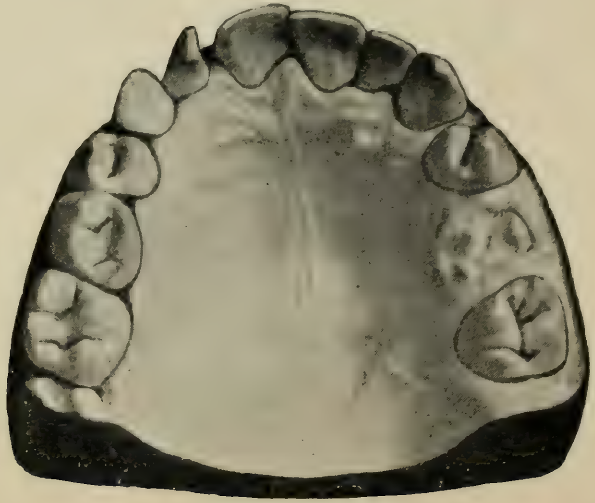


FIG. 6.

THE DENTAL RECORD, LONDON: NOV. 1, 1897.

THE MEDICAL TREATMENT OF TOOTHACHE.

THE internal administration of drugs for the cure of toothache is not a practice largely adopted by dental surgeons. If we distinguish between toothache and neuralgia—and the distinction is useful clinically, though we may be unable to draw any hard and fast line between the two—then experience teaches that the former is usually so readily cured by local treatment that constitutional remedies are scarcely needed. Still they have their value, and it is possible, that we, as dental surgeons, underestimate this. For though toothache is, as we have said, usually amenable to local treatment, still, in some cases, the result is not immediate, and in others, local treatment, other than extraction of the tooth, seems to fail entirely. Our attention is directed to this subject by a paper by Dr. Coley, published in the September issue of the *Practitioner,* which, although somewhat open to criticism on minor points, yet contains a few statements which merit consideration. We are afraid, however, we cannot follow this author's views as to the pathology of toothache, using the term in its broader sense. He says:—"Thousands of people have carious teeth without toothache, which proves that caries is only one factor in the production of pain. The other factor may (and commonly does) prove to be removable, and then the pain ceases, though the carious tooth remains." Now, caries, rightly considered, is but a predisposing cause of toothache, it exposes the pulp and allows exciting causes, as cold, foreign bodies, acids, &c., to play the part of irritants; or, having led to necrosis of the pulp, it provides a channel for the ingress of organisms which in time become irritants to the surrounding tissues. It is a well known fact that micro-organisms have but little power on tissues which are healthy, and hence it follows that in many cases a lowering of the vitality of these tissues is needed before these germs can cause them to inflame, or, in other words, can cause pain. Still, the factor, par excellence, in 99 cases out of a 100, is the carious tooth, and although it is eminently desirable to give the patient relief at once, if it be possible by the administration of drugs, still, unless these carious teeth be treated and placed in a healthy condition, the result can only be described as amelioration, not a cure of the disease. For, although this may be "another story," toothache is almost the least of the evils following carious teeth. Pain is nature's danger signal, and toothache is the warning of worse things to follow, of chronic dyspepsia, of abscess and necrosis of bone, of antral michief, of ulcerated tongue and possibly epithelioma. If, therefore, it be possible to find a curative "toothache mixture," the general practitioner may prove to be a sorry friend, soothing with present comforts and letting the patient drift on to more serious disease. The internal administration of drugs must therefore be considered as an adjunct to the treatment of the disease and not as a cure. In other words, we cannot conceive that the medical attendant does his duty to his patient if he does not insist on the patient having his teeth "set in order" at the same time that he gives him temporary relief. This, we gather from other parts of the above-mentioned paper, is Dr. Coley's own view. We said *temporary* relief, and this purposely, because Dr. Coley says :—"A toothache which is 'scotched' by appropriate means often ceases permanently; or it may return once or twice (being again relieved by the same, or some other, remedy), and then finally disappear." Most toothaches cure themselves naturally and "finally disappear"; there is usually an end to all things, and if this be the only prospect offered by the medical treatment of toothache it is not alluring. Dr. Coley uses the term toothache in too wide a sense: we are never clear whether his remarks apply to toothache, the result of an inflamed pulp, or to an inflamed periosteum; whether the toothache is due to a calcareous degeneration of the pulp or an exostosis of the root;

whether it is rheumatic in nature, or due to a debilitated state of the system, or, lastly, whether it is really one of those cases of tic for which treatment, even nerve stretching or excision, has done so little.

Amongst the treatment advocated we note that Dr. Coley has had good result from the administration of "salicylate of sodium" in doses gr. xv. repeated every four hours, this being specially indicated "where the pain is started 'by taking cold'"; whilst the addition of gr. xv. of tincture of belladonna is often advantageous. Exalgin, gr. xx., dissolved in half a drachm of rectified spirit, and given with water, has proved sometimes useful but uncertain. He also advocates the combination of hydrobromic acid with those useful drugs, sulphate of quinine and tincture of gelseminum. Alcohol, so often useful, he regards as even more objectionable than narcotics: "One of the most melancholy cases of alcoholism that ever came under my own observation had its origin in the inconsiderate recommendation of stout as a remedy for dental neuralgia." Finally, he has a good word to say for the time honoured methods of treating toothache and neuralgia by applying some cocaine to the gum, or by placing carbolic acid in the carious cavity, though we would suggest there are many more efficient methods than placing "a pledget of dry wool over the carbolised wool to retain the acid."

News and Notes.

THE Annual Dinner of the Past and Present Students of the Dental Hospital of London will be held on December 4th.

IT is said that Dr. Thomas Evans, of Paris, proposes to devote the bulk of his fortune, which is large, to founding in New York a Dental College and other benevolent and educational institutions.

THE calendar of the Royal College of Surgeons of England states that there are 1,186 Licentiates of Dental Surgery. During the past year the Board of Examiners in Dental Surgery held two meetings for the examination of 141 candidates, 98 of whom received the licence and 43 were referred. The fees paid by candidates amounted to £1,029, the Board receiving £592 4s. We may remark that it is probable that some of the 43 referred candidates are included in the 98 passes, having succeeded at the second attempt.

At the Lichfield City Police Court, on October 21st, Edwin Benjamin Morgan, of Nechells, Birmingham, and of Tamworth Street, Lichfield, was summoned for obtaining 7s. from Mrs. Gumley by false pretences, and also for unlawfully, wilfully, and falsely using the name of dentist. Mr. Tyler (Birmingham) appeared for the prosecution, and Mr. W. S. Pritchett (instructed by Messrs. Coley & Coley, Birmingham) for the defendant. Mr. Tyler, in opening the case, said that the law had been so provided as to protect persons who wished to be treated by surgical operation from being so treated by incompetent persons. The Dentists Act was passed in 1878, and it provided that no person should be entitled to use the word dentist, or describe himself as a dentist, unless he was registered in the *Dentists' Register*. Mrs. Gumley stated that she went with her daughter to the defendant's rooms, in Tamworth Street, Lichfield. When she saw him she asked him if he was Mr. Morgan, the dentist, and he replied in the affirmative. He then examined her daughter's teeth, and said that two wanted stopping. It was decided that the teeth should be stopped, at a fee of 3s. 6d. each. She paid him 3s. 6d. She saw the defendant on the following Friday, and asked him if he were Mr. Morgan, the dentist, or his assistant. He asked her why she put the question, and she replied that she thought he might be the assistant. Then he said, "I am Mr. Morgan, the dentist." Upon that her daughter seated herself in the revolving-chair. He filled the two teeth, and she paid him 3s. 6d. She relied upon Mr. Morgan being a dentist, and had seen him advertised as a dentist. In reply to Mr. Pritchett, witness said that she knew Mr. Morgan was a dentist before she saw him, and she simply put the question to be sure of his identity. Re-examined: If he had said, "I am Mr. Morgan, but I am not a dentist," she would not have employed him. The daughter, Eva Gumley, also gave evidence, and stated that two of her teeth were dressed by the defendant. The dressing, however, came out, and she swallowed it. Mr. Tyler put in the *Dentists' Register.* Mr. Pritchett, addressing the Bench for the defendant, said a more preposterous prosecution he had never heard of. This was a criminal prosecution brought against a respectable man who had practised as a dentist for seven or eight years. In order to constitute a charge of this kind it must be made out that the statement relied upon was untrue; secondly, that it influenced the person to pay the money; and, thirdly, that it was made with the intention to defraud. Not one of these points had been made out. The question put to Mr. Morgan as to whether he was Mr. Morgan, the dentist, was simply put to settle the question of his indentity, and had no reference whatever to his qualifications. The Mayor said that the charge of obtaining money by false pretences would be dismissed. Mr. Tyler said that the second summons related to a different matter. The Act laid it down that no person who was not registered was entitled to use or take the title of dentist, and any person infringing the law was liable to a fine of £20. Evidence having been given, Mr. Pritchett contended, for the defendant, that the Act was passed to prevent people practising and leading people to suppose that they were registered; it did not prohibit the practise of dentistry by people who were not registered. The only thing the Act did was to make it illegal for a person to hold himself out to the world as a registered dentist when he was not. The Mayor said the Bench considered the case proved, and they fined defendant £2 2s. and the costs. They consented to state a case for a higher court on the point of law.

THE following curious letters sent us by a correspondent may not be without interest:—

My Dear Sir,—If you were to send me the material to take the impressions for my teeth could I do the needful? I am feeling much better. This is a grand place. Still plenty of pain about at times.—Yours truly, etc.

Sir,—I have thaught it over about the teeth I was seaing you about last Wensday and it is a lot of money for a Poor Man to find. I should feal oblige if you would let mea know the lowest price you can do it for and make a good job of them or if you can Poot Mea sum dubble wons on the one side and what conditions you would put them in on yours Truley, etc., etc.

THE *Münchener medizinische Wockenschrift*, No. 31, 1897, contains details of a death the result of alveolar hæmorrhage in a hæmophilic subject, Herr E., who with his two brothers, suffered from hæmophilia, caused by trying slowly to remove a loose left upper first molar, thus tearing the gum. Having tried several domestic remedies without stopping the bleeding, on the second day he consulted a medical man. He found the tooth hanging by a piece of the gum and much bleeding ; the other two molars were loose, the whole mucous membrane was sore, and hyperhæmic from the application of perchloride of iron. By means of the electric cautery he succeeded in stopping the bleeding, and sent the patient home with proper instructions. In the course of about an hour the cotton wool dressings were again soaked with blood, and on removing this the hæmorrhage was greater than ever and from a larger area. Every means were tried, hot water, steam, perchloride of iron plugs, turpentine, antipyrine, ergot, ice bags and "stent" compresses, but with negative result. The efforts of two other physicians were of no avail. Normal salt solution was injected three times to make up for the lost blood, but on the eighth day the patient died. It is worthy of note that the patient had himself previously removed a loose premolar. At that the bleeding had spontaneously ceased on the second day.

THE January number of *The Practitioner* states that a respectable citizen of Iowa, aged 67, was sitting by his kitchen window one afternoon, when to him entered a neighbour, who in a friendly way began to use him as a target for revolver practice. This was the state of things found two hours later by a surgeon, Dr. E. W. Clark. One bullet had gone through the window without hitting the man. A second had entered the face over the mental foramen of the left side. This struck the plate of a set of false teeth, and, passing, came out at a point just over the angle of the jaw, cutting through the lobe of the left ear. This bullet also went out through the window. The human target would almost seem to have borne a charmed life, for a third shot, which had been aimed squarely at the epigastrium, struck a large bone button on the waistcoat. It was found on the floor.

THE *American Dental Weekly* states that "A denture made of iron-plate was shown at the Great Brittany Club, by Mr. Sidney

Spoker. The plate was made and worn 32 years ago, by an engineer, who is now 78 years of age. It has three pieces of bone rivetted on it with iron nails!—F. A. B." The Odontological Society of Great Britain and Mr. Sidney Spokes will probably not recognise themselves under their new titles. Possibly "F. A. B." was using his scissors and paste in the very small hours, or was it a printer's error? Poor printer!

SOME OF THE DEMONSTRATIONS AT THE DUBLIN MEETING OF BRITISH DENTAL ASSOCIATION.

Mr. R. P. LENNOX demonstrated the casting of dies and counter-dies for plate-work, using a Pearsall sand-moulding flask, by means of which a die is obtained reproducing the model with a strong cone at the back of it. The advantages of such a die were pointed out. In the course of making the die Mr. Lennox showed a simple and safe method of withdrawing the model from the sand, a method which onlookers appeared to appreciate highly. A metal disc fitted with a haddle was attached to the model with a drop of wax, and so the model was lifted.

Mr. Lennox next showed how he makes his counter-dies so as to secure in one counter the advantages of deep and shallow counters combined. He wrapped a roll of modelling clay along the line of the edge of the desired plate, and dipped the die far enough into the molten lead to fully cover the clay, and then showed how readily a plate somewhat larger than was actually required could be passed into the counter. He then went on to show the working of a drop hammer for swaging introduced by Mr. Charters Birch, of Leeds.

Mr. ALF. JONES demonstrated the Lennox method of obtaining a cast of the root-faces of a number of anterior teeth with metal-lined reproductions of their canals and then form but one impression. The demonstration was suggested by a case in practice in which five teeth were dealt with simultaneously, and the actual model for which was shown as a striking example of what could be done by this method to avoid working at the mouth.

Dr. E. A. ANGLE demonstrated the use of the apparatus which bears his name. The first case was one in which the first permanent molars had all been extracted for caries, and where, in the absence of grinding teeth, the lower permanent incisors bit outside the uppers, except the left permanent central.

For the second patient Dr. Angle applied his fracture splint to a supposed fracture through the symphysis of the mandible.

Mr. S. G. REEVES demonstrated a new form of crown. After the destruction of the pulp the chamber is made perfectly square and very much enlarged. The nerve canals are treated and filled and the patient is then dismissed for a few days. All being well the operation of crowning is commenced by squaring up the external or neck portion of the tooth, and if necessary by enlarging the square of the pulp chamber. A piece of thin *soft* platinum is then made to fit the square chamber, either in the mouth or on a model, and a ferrule is made "also of platinum" to enclose the external portion or neck of the tooth. These two parts are then soldered together with pure gold, forming a cap, which is replaced and malleted home to obtain a perfect fit. A bite with the cap in position is then taken. On this cap the porcelain part is then built up, Ash's high fusing body, with the help of Dall's furnace being used, three firings generally being found sufficient.

Mr. GARTRELL demonstrated his continuous gum and crown gas furnace. A full upper set was fired in about 10 minutes starting cold. The nickel muffle prevents "gassing."

Mr. GARTRELL also exhibited his shot swager, showing the method of lining impression with sheet tin and swaging, trial pattern and polishing plates for vulcanite work. One feature in the process is casting dies in a new fusible metal into plaster or composition impressions. These dies are also used for swaging platina plates for continuous gum work with shot, one die only being required. The plates fit better than when struck up with a hammer, the pressure of the shot being distributed evenly over the plate.

Mr. E. LLOYD-WILLIAMS showed a three part flask of his own design, and advocated its use as affording compensation for expansion of plaster (thus avoiding raising of the bite); facility of packing in all cases, however difficult; the non-mixture of base and gum rubbers ; and stability of teeth whilst packing. The latter feature was secured by a method of covering irregularly the exposed surfaces of the teeth *before* flasking with an oxychloride of zinc or other cement, the rough surfaces being well secured in the investment.

Mr. William Helyer, L.D.S.I., repaired a crown on a central incisor.

Mr. John Stanton, L.D.S.I., demonstrated the use of cataphoresis first on a patient with an imperfect amalgam filling. The patient could not tolerate the slightest touch nor cold water. The electric current was applied from one of Mr. Cottrell's cataphoric apparatus, the agent used being a 30 per cent. solution of cocaine in absolute alcohol. After an application of seven minutes the tooth was excavated and cold water injected freely without any discomfort to the patient.

In the second patient a small shallow cavity on the buccal surface at cervical edge of a mandibular first molar, was, after a 30 per cent. solution of cocaine was used, and 10 minutes of a very weak current allowed to pass, excavated with slight pain.

Abstracts and Selections.

OXYCHLORIDE OF ZINC.

By H. T. King, D.D.S., Fremont, Neb.

I have nothing new to present to you to-day, but wish to call your attention to something that was formerly much used in dentistry, but that the older men in the profession seem to have gradually ceased to use, and that I fear the younger men have never learned the value of.

Previous to the introduction of the zinc phosphates, oxychloride, under that name or as osteo-plastic, or os-artificiel, was much used for root filling, pulp capping and temporary fillings in live and dead teeth. Our modern plastics withstand the wear of mastication much better than oxychloride and I can readily see why that material was so quickly displaced as a temporary filling ; but I am old-fashioned enough to still think it sometimes indicated in root canals.

I said the idea of mummifying pulps had been revived. Your memory may not go back so far, but if you will read the literature of twenty or twenty-five years ago, you will see that it was quite common to have the pulp in a tooth mummify. The difference being that at that time they did not want mummified pulps and were careful to use some method to avoid bringing about that condition.

Listen to some quotations from papers and discussions of twenty years ago :

" The failures in preserving the vitality of exposed tooth pulps by oxychloride of zinc, as formerly applied, have revealed the fact that chloride of zinc in strong solution dries the pulp tissue and mummifies it. Admitting this a fact, chloride of zinc would seem to specially recommend itself as an application to root canals in which a portion of pulp tissue remains,"—Dr. Rehwinkel.

" I am not an advocate of capping, but when the pulp has given no trouble and is very little exposed I use an oxychloride cement. If the pulp dies under it, the cement has often the power of mummifying it."—Dr. Cryer.

" Oxychloride of zinc is well adapted for the purpose of covering pulps. Such fillings appear to impart antiseptic or embalming properties to a devitalised pulp to such a degree as to have obtained for this article an unwarrantable reputation for preserving it alive."—Dr. S. B. Palmer.

" Chloride of zinc has repeatedly been introduced into canals to save the pulp, and has converted them into a hyaline body that has been a perfect filling, without any change in the colour of the teeth."—Dr. W. H. Atkinson.

You will find in reading the history that the mummification of pulps was a condition frequently found, but no one at the time thought it a desirable one. If

" Cæsar dead and turned to clay
Stopped a hole to keep the wind away."

his imperial majesty could do no more harm.

On the other hand Ptolemus II. embalmed in the highest style of the art would have been a breeder of pathogenic micro-organism within fifty years if he had not been packed away and kept dry. Did you ever think of the fact that mummies are only found in a very dry climate? And do you think that the root canal will remain dry if the contents is only a dried and shriveled up pulp? I do not, and cannot believe it to be good practice to intentionally leave dead pulp tissue in a tooth.

I say intentionally, for I admit that with the most careful manipulation we may not succeed in removing every particle.

Admitting that there may be a small amount of tissue that needs mummifying, I hold that there is nothing better for the purpose than chloride of zinc, and that, combined with the oxide, it makes as good a filling as can be used in root canals. Do not take my word for this but note some things men who have been thinkers, teachers and successful practitioners, have said on the subject.

"I always fill the pulp cavity with osteo-plastic. That is the thing, as I understand it, and there is nothing better. It acts as a disinfectant, and is an excellent filling for the root."—Dr. Clowes.

"A thin almost fluid mixture of the oxychloride of zinc filling is best adapted for this purpose. Although not as fluid as a gutta-percha solution, it has this great advantage, that it will exert its drying and preserving or mummifying effect upon the tissue remaining, incorporating itself therewith, and preventing any future putrefactive action."—Dr. Rehwinkel.

"For permanently filling the pulp cavity carry a small pellet of cotton to the extremity of the root, pack solid, and complete with oxychloride of zinc. The oxychloride so long as it retains its chlorine will remain as a constantly present preventive against furure development of spore."—Dr. Rogers.

"Its application to root filling has been very satisfactory with many of the best men in the profession. It can be carried to the extreme ends of the roots of teeth. Its antiseptic properties lessen the likelihood of periosteal difficulties, and there is not that incompatibility existing between devitalised teeth filled with this in the root that there seems to be when metal is used."—Dr. Howard.

I am in the habit of filling (roots) always with oxychloride of zinc, because of the antiseptic character of the chloride. It prevents further decomposition as far as anything I know of."—Dr. Allport.

Speaking of immediate root filling Dr. Ottolengui has said: "I think that a coagulant is here indicated, and that the one better than all others is chloride of zinc. The pulp being removed, and the medicament applied, what results? The escharotic property is exerted at the point immediately in contract, and the animal matter is destroyed. But this action is circumscribed. Somewhat deeper a coagulum is found. But there is another property which this agent possesses, and that is the mummification of animal tissue. This, I conceive, is what occurs in the minutest portion of the tubuli."

Some one will ask, what will happen if this material passes through the foramen? It will hurt, just as any escharotic brought into contact with soft tissue will cause momentary pain. This, however, ought to be of short duration. I do not think it well to allow any root filling to pass much beyond the end, but know of no reason for expecting more trouble from a little oxychloride of zinc than any other filling material. One more quotation: "Chloride of zinc locally applied is recognised as among the most efficient agents known for promoting healthy granulations, as, in addition to its escharotic properties, it appears to exercise a greater influence over the vital action of neighbouring parts than most other caustics; the separation of its eschar leaving healthy and vigorous granulation. It is equally efficient as an antiseptic and disinfectant. The antiseptic and stimulating action of the chloride of zinc is of a most beneficial character, inducing in many cases better organization of the tissues in the living parts to which it is applied."—Dr. D. D. Smith.

Oxychloride of zinc as met with in the dental depôts consists of a watery solution of chloride of zinc in one bottle and the powder in another. The powder having been prepared for use as filling material, has mixed with the oxide of zinc such materials as powdered slate, flint, feldspar, silex and borax, this to improve the colour and give hardness. Particles may be found too coarse to enter a fine canal. For that reason I prefer the oxide alone: mixed with the fluid it gives a dead white and is superior to paper or anything else for lining frail teeth to improve their colour.

The oxide of zinc can be found at any drug store, and the fluid may be prepared by placing zinci chloridi ℥ I in a flat porcelain or glass dish, and allowing it to stand a few days in a damp place. It will take from the atmosphere water enough to deliquesce, or you can make your liquid by fully saturating muriatic acid with metallic zincs, allowing it to stand a day or two uncorked. Either solution should be filtered before being bottled for use.

Its strong affinity for water is one of the best points in favour of this material for root canal fillings. You all know that in the use of guttapercha the prime requisite is absolute dryness. This I conceive is very difficult to obtain in many canals we find. I feel certain that hot air will not dry them, and have never seen a root dryer that was fine enough to go where we are able to put some of the fine bristles we use.

If you attempt to work chloropercha into a canal that is not dry the material will not leave your dry broach to adhere to the walls, but will come back. Not so with my material, its affinity for water is greater than the mechanical hold on the broach, and it will stay. The only effect moisture in the canal can have is to make the mixture a little thinner.

I understand the claim for guttapercha as a superior root filling to be that it is more easily worked and more certain in the results. Neither of these claims in my hands have been proven to be true. for after filling the canals in dozens of freshly extracted teeth with chloropercha, I have found myself unable to make any more perfect fillings than with the oxychloride. The fact that a number of members of this Society, as well as picked men in adjoining States, failed to do any better with teeth I sent them, leads me to think that this was not entirely owing to my awkwardness.

I must therefore decline to abandon a material that has so many good therapeutical points for one that is mechanical only in its results.—*Dental Review.*

ORTHOFORM, A NEW LOCAL ANÆSTHETIC.

By Professor A. Einhorn and Dr. R. Heinz.

Under this name a new synthetic product related in constitution to cocaine has been introduced into use for the production of local anæsthesia, as the result of an extended inquiry in the cause of the anæsthetic action conducted by the authors. From the account given by those authorities orthoform appears to be a substance of great interest on account of its being without toxic character, but at the same time a powerful antiseptic, and consequently, well adapted for use in the treatment of wounds. Orthoform will be manufactured by the company which has taken over the business formerly carried on by Meister, Lucius & Bruning, at Höchst, in the neighbourhood of Frankfurt, and it appears likely to be an exception to the many evanescent synthetic products that are forgotten so soon after being introduced.

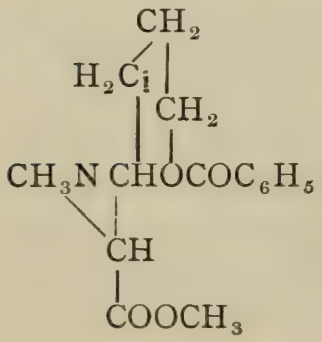
Orthoform is described as a white, voluminous crystalline powder, is not hydroscopic, melts at 120° C., slightly soluble in water, and has, on that account, an advantage over all other anæsthetic agents that are known, inasmuch as it is but slowly absorbed in consequence of its sparing solubility, and thus a durable effect is produced. The crystallisable orthoform hydrochloride is readily soluble in water ; it produces anæsthesia like the free ester, but as the solution has an acid reaction it is not always applicable.

The remarkable anæsthetic action of orthoform is manifested very decisively when occasion requires the tranquillisation of exposed nerve ends. The otherwise painful operation of transplanting living skin may be carried out under the influence of orthoform without any sensation. Orthoform has a remarkable effect upon burns, contusions, and painful abscesses, and it has been found very beneficial in the treatment of ulceration of the throat or stomach and in cancer. It is, moreover, so free from poisonous action that comparatively large quantities, amounting to nearly two ounces, may be applied in the course of a week for dusting wounded surfaces without any danger. Internally it has frequently been administered to the extent of from eight to 15 grains daily.

From a chemical point of view the account given by the authors of the investigation by which the characters of orthoform were ascertained is of considerable interest.

Starting on the assumption that cocaine is constituted of a double ring—in which a benzoyl oxy-piperidine carboxylic methyl-

I.



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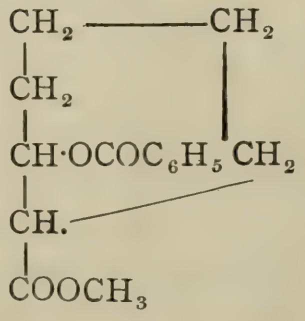

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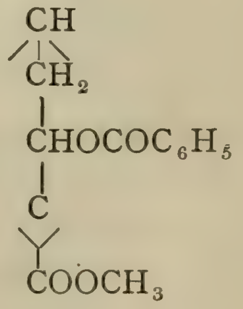
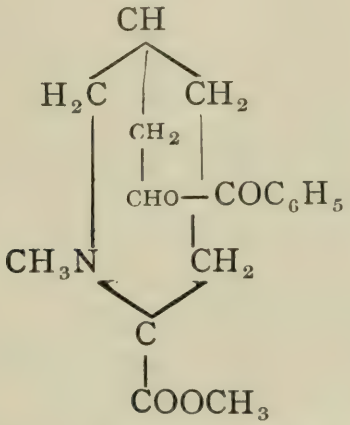


ester (having a methyl group attached to the nitrogen), as shown in the formula I., is associated with a benzoyloxyhexa-hydrobenzoic methyl-ester II., in such a manner that both rings contain the atomic group III., and that consequently benzoyl-ecgonine methyl-ester, or cocaine, would have the constitution represented by the structural formula IV.—the authors applied themselves to the task

IV.



of synthetically building up a compound of that nature which should possess, together with anæsthetic properties, the equally necessary characteristics of being non-toxic and not readily absorbed into the system, and thus preferable to cocaine, which is too poisonous to be freely used, and insufficiently durable in its effects in consequence of being so freely soluble and so readily absorbed.

The observations of Stockmann, Filehne, Ehrlich and Poulsson have shown that none of the products obtained by splitting up the cocaine molecule are capable of producing local anæsthesia—as, for instance, neither ecgonine methylester, the debenzoylated cocaine, the benzoyl ecgonine produced from cocaine by saponification of the group $COOCH_3$, nor ecgonine itself. The circumstance that benzoylated alkaloids, having no similarity in constitution to cocaine do produce local anæsthesia also led Filehne to the conclusion that the presence of a benzoyl group was an essential condition of the anæsthetic action of those bodies.

The physiological experiments made by Liebreich, Poulsson and Ehrlich with natural and synthetic cocaine derivatives that are ecgonine esters containing in the place of the benzoyl group other acid residues, showed that most of them are destitute of the power to produce local anæsthesia, and the results obtained justified the conclusion that the anæsthetic action belongs only to those compounds, analogous to cocaine, in which ecgonine esters are combined with particular (anæsthesiophoric) acid radicals. In that respect the group, $COOCH_3$ appears to play a very important part. It thus became a question whether the anæsthetic character was due to the peculiar double-ring constitution of cocaine, or to the ring of benzoyl-oxy-piperidine-carboxylic acid, having a methyl group attached to the nitrogen, as suggested by Merling's production of eucaine, or again to some peculiarity of the hydro-aromatic ring of the hydr-benzoyl-oxybenzoic methyl-ester present in the molecule, and one of the authors has been for some years engaged in the study of salifiable derivatives of hydro-aromatic oxyestors from that point of view, though as yet without success.

However, since other compounds of the aromatic series, such as methylene blue, have the effect of allaying pain, it therefore became desirable to study the action of benzoylated oxy-amido-benzoic esters in that respect. It turned out that this capacity was found to be characteristic of all amido-oxy esters belonging to the aromatic series, but that the body from which these benzoyl compounds are derivable—the amido-oxy-benzoic ester—has a greater capacity of producing anæsthesia than the benzoylated derivatives.

A large number of these compounds were submitted for trial by the authors, and details given in regard to 37 of them. They were obtained by reduction of nitro-oxy esters with zinc and hydrochloric acid, or by esterification of amido-oxy acids. Among the isomeric amido-oxybenzoic esters the *m*-amido-*p*-oxybenzoic-methyl-ester and the *p*-amido-*m*-oxybenzoic methyl ester were found to be anæsthetic without causing any irritation, and the latter is most rapid in its action. It is to this compound that the name orthoform has been given.—*Pharmaceutical Journal.*

THE USE OF SCREWS.

By H. W. Arthur, D.D.S., Pittsburg, P.A.

Cohesive gold and the control of conditions afforded by the introduction of rubber-dam, made possible large restorations of broken-down tooth-structure.

The use of screws in dental operations was born of the necessity for greater security for retention in restoring and contouring, and it is to this class that the use of screws is specially applicable. While crowning has taken the place of building up in extreme cases of restoration, the usefulness of screws has not diminished, but has rather increased. By their use foundatious may be made for crowns on roots that would otherwise be useless. By the use of small screws, in many cases, security of retention can be had where undercuts and grooves would endanger the pulp and throw the strain for retention on structure already greatly weakened.

In the minor cases of restoration or contouring where the small screws may be used, the screw does not seem to have had the recognition that it deserves. It may be claimed for it that (if judiciously inserted in those parts of the teeth best able to bear the strain) it gives the maximum retention security with the minimum loss of tooth-structure.

The use of the screw, as has been intimated, is in those cases where extra retention security is wanted, and it does not supplant old methods of retention in ordinary cases, though in many it may supplement.

In this model we have assembled a number of typical cases where screws may be used ; some where their use would be good practice, and others where their use would be more positively indicated.

Taking those where their use would be good practice, we would present first a central incisor with a large cavity on the distal surface ; the incisal angle is weak. For filling the cavity as it is, the ordinary methods of retention would be indicated ; but if we take into consideration that the incisal angle is liable to fracture, and there may be objections to anticipating this by cutting it away, the resort to the use of screws is certainly good practice, as it will not only afford security for retention as it is, but also in the event of fracture, in which case an additional screw near the incisal edge will give security for retention in restoring the incisal angle.

The upper first bicuspid is another case of this class. The tooth has a filling on the mesial surface extending across the occlusal, including the distal, surface. The disto-bucco-occlusal angle is contoured. A screw was placed at the disto-bucco-gingival angle. The lingual surface is broken off, leaving the filling exposed along the entire lingual side. We have here ample space and room for placing two screws, which will give retention security for restoring the lost part and will assist in retaining the first filling.

The lower first bicuspid, together with the second bicuspid and the first molar, show another class of cases where the small screws may be used to advantage. It is noticeable that the occlusion on the first bicuspid distal surface is close, dipping into the cavity space. This might be filled successfully by undercutting, but with less loss of tooth-structure, with greater retention security, and with more ease by the use of a screw. The disto-occlusal angle is wanting, so that a screw can be readily placed pointing toward the mesio-lingual angle.

In the lower second bicuspid the mesio-buccal and lingual angles are broken down ; the sulci have no faults ; the bite is close ; there is a broad seat for the filling at the gingival line. The opposite point of retention, by the ordinary methods, would be made by undercutting near the occlusal surface, or cutting through that surface into the sulci for anchorage. By the use of a screw anchored in the strong body of sound tooth-structure, near the occlusal surface, greater security for retention can be had with no weakening of the tooth-structure.

The lower first molar is somewhat similar ; in this case the strain being greater, a larger screw may be used. Placing it in the body of the tooth, near the occlusal surface, a seat is made for a small screw near the mesio-bucco-gingival angle, and others might be placed. Still another in this class of cases where the small screw may be used to advantage is shown by the tooth in the place of the upper second molar ; the tooth is an upper third molar. It is in that tooth, in place, that screws may be used as here shown. The screws are placed through the cavity, near the disto-gingival line angle, in the dentin.

Where the breaking down of the angles necessitates a resort to contouring, the use of screws is more positively indicated. The point of opposition for wedging in these cases by the ordinary methods is wanting, unless resort is had to deep cutting, which will endanger the pulp, and even then will not afford the security for retention which can be had by the use of screws. We have here in the model several cases of that class.

There are other cases where the use of screws is positively indicated, where retention security cannot be had without them. The upper cuspid is an example of this class. It is worn down about one-half, is perfectly sound ; the pulp-chamber is well protected by secondary dentin. In this case, without disturbing the tooth-structure other than for placing screws, perfect retention security can be had.

In many cases where access may be had to the pulp-canals, screws of the larger size may be used and supplemented by smaller ones. Where roots are badly broken down, so that the margins are wanting, the use of screws for securing a foundation of amalgam for crowning cannot be overestimated.

The location of screws is a matter of considerable importance. It should be at a point readily approached for inserting both the screw and the filling. It should be as far as possible from the pulp and not too near the margin of the tooth, and consequently at a point where there is the greatest bulk of tooth.

In the incisors and cuspids the point that meets these requirements best is the linguo gingival angle, either mesial or distal. This point should be made accessible by free cutting if need be, as it will not weaken the tooth.

With caution screws may be placed at the labial angles. Usually it will require considerable space, but there should be no hesitation about making space, as a little more exposure of gold is a matter of small consequence compared with that of avoiding the pulp and margin and getting the screw fixed.

Where there is sufficient space a screw may be placed near the incisal edge in the dentin, otherwise there is a liability of encroaching on the enamel plates or the pulp by placing a screw at this point.

In the bicuspid and molars where there is sufficient space (and in many cases it would be good practice to make space), the best point is in the centre of the body of the tooth, near the occlusal surface.

In many cases we have to be governed by the convenience of approach and the relation of the pulp in selecting the point for placing a screw.

Where the course of the pulp-canal is used for placing screws, the shape of the roots and their size should be considered, especially in the posterior teeth, where large screws are used.

For cavities in the upper molars, the lingual root is the best, as it is the largest and most readily approached.

For securing a foundation for crowning it is best to put in two screws. This can be done in bicuspids and in molars by using more than one root.

In regard to the use of screws in practice, many no doubt " lose the good they oft might win by failing to attempt," and others by failing in the attempt. It would seem to be a simple operation to place a screw, and yet to be successful, care must be taken in each detail, and always especially in placing the small screws.

To avoid confusion care should be taken in the selection of the size of the instruments and screws ; and where these are not fixed in sets, they should be tested *always* before using. This confusion can in a great measure be avoided by confining ourselves to the use of two or three sizes of screws ; in most cases two will do—the small size anchor screw, one hundred threads to the inch, and a large size about forty-eight threads to the inch.

For the anchor screw there is a set of instruments complete that could not well be improved upon, though there may be a choice of these. When no drill is furnished with the tap and carrier it is well to test the drill as to size each time before using.

As to the manipulation in the use of the anchor screw, having decided where we will place our screw, we should make sure that the way is clear to direct approach to that point.

The first step in the manipulation is to countersink with a small round bur a seat for the filling at the points where the drilled hole is to be.

With a " limit drill " in the engine, carry the drill steadily up to the shoulder, and then withdraw quickly while it is revolving ; if allowed to stop it may break off in the drill-hole when you attempt to remove it.

Take the tap, place it cautiously in the drilled hole, give one or two turns ; when it is engaged let it be free, so that it may line up with the drilled hole, repeating this procedure with gentle pressure until the tap is arrested. It must be kept in mind that the instrument is a delicate one, and may break in the hole if rudely handled.

We prefer the screw-chuck as a carrier, because we can regulate the length of the screw and the screw is held firm, so that in placing it the thread on the wire or in the tooth is not liable to be torn. With the screw in the carrier the procedure should be the same as with the tap, leaving the instrument free after every few turns, that it may be in a line with the drilled and tapped hole. It should be tested by gentle turning to make sure that it is fixed. Then loosen the handle from the shaft first; unscrew the shaft from the anchor screw. A word of caution: the drill and tap being more slender than the chuck-screw carrier, it must be borne in mind when using the former that room must be left for the use of the latter, so that it may not come in contact with the tooth at any point other than the seat of the filling when the screw is placed or being placed.

The placing of the larger screws in the pulp-canal, while not requiring the same delicacy of manipulation, requires care. Where the roots can be approached directly but little difficulty will be experienced; where they must be approached at an angle, as in the case of the lower second molar in the model here shown, the main difficulty is in making the drill-hole in a line with the course of the canal. The right-angle attachments do not supply the need. An instrument such as we have here is one that can be depended upon; the reach is long enough, and yet not too long; the shifting angle is the main advantage to be had in its use.

The short finger chucks can be used for tapping and placing the screws.

The presentation of our subject—the use of the screw for filling, and especially the use of the anchor screw—is not complete without some reference to the manipulation about the screw in filling.

The object in making a seat for the filling, in which the screw is placed, is to give stability to the filling. And this is accomplished by condensing the gold around the base of the screw and following it up until the screw is covered. When we consider the limited amount of surface the screw presents, we can understand how necessary it is to condense the gold well to make it secure. For this reason we would advise the use of small pointed pluggers, straight and contra-curved.

Gold should be worked all around the screw from the first, and not wedged in on one side, leaving the other side unsupported.

Some object to the use of screws on account of the complications and care necessary in placing and filling, but this certainly has no weight compared with the security and results attained by their use.—*Cosmos.*

CONTINUED STUDY OF THE RELATIONS OF THE FRONTAL SINUS OF THE ANTRUM.

By Dr. THOMAS FILLEBROWN, Boston, Mass.

DR. FILLEBROWN in this paper reviewed briefly his report of last year upon eight instances of what has been considered an abnormal anatomical condition, namely: When the infundibulum continues directly to, and terminates in the foramen of the antrum, a fold of mucous membrane extending above the foramen, forming a pocket, from the bottom of which the opening into the antrum is situated, thus directing any discharge coming down the infundibulum into the antrum, no abnormal discharge from the frontal sinus escaping into the nasal passage until the antrum was so filled as to cause a backward overflow. Finding this condition to exist in eight subjects examined by himself seemed to imply that the presence of this pocket membrane was the normal formation.

In the present paper Dr. Fillebrown reports the examination of 15 heads in the Harvard dissecting room, in every one of which this condition was found to exist (with some minor variations only sufficient to prove the rule), giving a total of 23 cases, a number sufficient in his judgment to establish the fact of the normality of the anatomy of the parts.—*Ohio Dental Journal.*

REPORT OF A CASE VERIFYING THE STATEMENT, FIRST MADE BY DR. M. H. CRYER, SHOWING DIRECT COMMUNICATION OF THE FRONTAL SINUS WITH THE ANTRUM OF HIGHMORE.

By T. W. BROPHY, M.D., D.D.S., CHICAGO, ILL.

THE superior right bicuspid and molar teeth had been removed, and a small opening made into the antrum before the case came into the hands of Dr. Brophy, irrigation being carried in by syringing daily with the usual antiseptic solutions. No satisfactory progress being made in arresting the disease, the patient was taken to Dr. Brophy for diagnosis. Exploration by means of a silver probe revealed no diseased bone, and a more extensive opening and also a more thorough drainage was recommended. The patient seemed at first to improve after the operation, but after home treatment for two or three months returned in the original condition.

It was then decided to remove a greater portion of the anterior wall of the antrum. The operation revealed a thickening of the mucous membrane, with polypi upon its surface, besides a small piece of rubber tubing which had been lost in the cavity. The cavity was thoroughly curetted, packed with boracic gauze, the packing was removed daily for about a week, when a hard rubber canula was made retaining the full size of the opening, preventing the closing of the opening by granulations, and enabling to thoroughly irrigate the cavity and watch the process of repair.

The accumulation of pus persisted at the upper nasal surface of the cavity, and after two or three months of the most vigorous treatment, it was decided that the frontal sinus must be involved Accordingly an operation was made opening the sinus, which was found to be filled with pus. The anterior wall of the frontal sinus was removed, exposing the cavity to view, when it was found to be denuded of membrane. By carrying the incision downward along the inner canthus of the eye, a silver probe was passed directly into the cavity of the antrum without obstruction. Water was forced into the frontal sinus, which readily found its way through into the antral cavity. Pus also dribbled from the region of the ethmoid cells. These cells were curetted, some diseased bone removed, and the whole thoroughly irrigated. Irrigation and antiseptic dressings, together with the insertion of a drainage tube, completed the operation, suppuration finally ceasing, though a thick glossy mucus occasionally comes from the nasal cavity. This case, in the judgment of the writer, had its origin in a dental alveolar abscess of the teeth which had been removed before the patient came to him. The cure of cases of this character could not possibly be effected by opening and treating the central cavity alone.

The feature especially presented was the anatomical relation of the frontal sinus, infundibulum and antrum of Highmore.—*Ohio Dental Journal.*

PITIABLE CONDITION OF A GIRL FROM USE OF X-RAYS.

Miss Josie MacDonald, of 9, West Forty-fifth street, New York, is lying at her home in a pitiable condition as a result of a 20-minute exposure to X-rays during the latter part of June, when an X-ray photograph of her upper left jaw was taken by a man whose name is supposed to be O'Connor. The young woman had for some time previous been suffering with intense pains in her jaw. She went to Nelson Shields and George F. Jernigan, dentists, who diagnosed her disease as necrosis.

In order to determine the exact cause they decided to have an X-ray photograph taken of the jaw to see if there was an old root there. The young woman was taken to the laboratory of Mr. O'Connor, who had been recommended to the dentists by Dr. Lee. The first photograph taken was not a success on account of too short an exposure, and it was resolved to have another one taken. The second photograph was taken the next day, with an exposure of 20 minutes, and proved the dentists' diagnosis correct.

A few days afterward Miss MacDonald's face began to swell and grew black. Dr. Henry Griswold was called, and he commenced treating the case as he would an ordinary burn. The hair on one side of the patient's head began to fall out, and in a short time that part of her scalp was bare. Her face was blistered, and sores formed all the way down her neck, shoulders and arm. A scab formed over the blister, and when it fell off it disclosed the raw flesh. Her left ear swelled up, and she lost her hearing on that side. Constant applications of oil have been necessary day and night to allay the pain arising from exposure of the flesh to the air.

Dr. Griswold said that he could not tell who was responsible for the condition of his patient.

Miss MacDonald has placed her case in the hands of Sullivan and Cromwell, attorneys, at 45, Wall Street, and an action will shortly be commenced against the dentists.—*American Journal of Dental Science.*

ANCIENT DENTISTRY.

Read by F. K. Ledyard at the Pacific Coast Dental Congress.

I have found this a most fascinating subject, and only wish that I had begun years ago to study it more closely. I will quote largely from Dr. B. J. Cigrand's work, "The Rise, Fall and Revival of Dental Prosthetics," now in its second edition. I am also greatly indebted to Dr. W. C. Barrett, Dean of the Dental Department of the University of Buffalo, and former President of the American Dental Association, for many valuable personal letters containing information not yet published.

Some of the specimens which I will show you this evening antedate the founding of Rome, and come from that classic period before those "dark ages," more commonly called "the middle ages," when all arts suffered; this covered a period between the fifth and eighteenth centuries, variously estimated at one thousand years. During this time dentistry took a backward step, and went into the hands of the blacksmith and barber. Still later a good deal of the surgical and medical practice went into the hands of the priesthood; but early in the fourteenth century, a council of the Roman Church, held in Paris, decreed that the monks and priests be forbidden to perform bloody operations: so to the barber fell the dental art, and continued so for centuries. A jesting poet speaks of the barber surgeon, thus:

"His pole with pewter basin hung,
With rotten teeth in order strung,
And cups that in the window stood
Lined with red rags to look like blood,
Who shave, drew teeth and bled a vein."

And to-day in your own city can be seen on Barbary Coast just such a picture, save the "cups lined with red rags to look like blood."

As to what was done in the dental line by that great surgeon, Æsculapius (who lived some 1,215 years B.C.), and Hippocrates, his fourteenth or seventeenth descendant, 450 years B.C., we will not treat; all work at that time by them, in the oral cavity, was (as far as we have any means of knowing) simply in the line of giving relief from pain; and as to the native home of dental prosthetics, it is, as far as I know, only conjecture. Dr. Barrett says: "I have in my possession specimens of ancient dentistry dating back 750 years B.C." This was taken from Cigrand's work. The authenticity is undoubted. He has the certificate of the officer in charge of the exhumation. The specimen was taken from an ancient Etruscan tomb. The laws of Italy prescribe just how the exhumation of these ancient relics shall be prosecuted, and place the work in charge of specially appointed officers, who are compelled to see that the regulations are carried out. This specimen dates from about the time of the founding of Rome by Romulus and Remus. It consists of natural teeth bound in place by bands of gold, and is the oldest piece of dental art in existence. The artificial teeth crumbled to dust when removed ; the small upper cup was made at a comparatively late period, as the teeth are made from mineral paste not over 110 years ago. The next two are copies of Etruscan pieces about 500 years B.C. They are fitted about existing teeth and then metal pins were inserted in holes drilled through the bands and teeth ; then they were slipped in place, but must always have been rather moveable.

The next exhibit was described as the " most curious and valuable piece of dentistry that exists " (if it exists at all) ; concerning this Dr. Barrett says: " Its existence rests upon tradition. The original drawings are found in an Italian museum, but only the drawing. It is said to be a piece of Phœnician work that antedates mine by 200 years or so. It is said to have once existed, but cannot now be located, and consists of teeth held together by gold wire." In the next row below are two pieces ; the smaller is quite modern, and could by no possibility belong to the era of the other. The one at the left of this, and the one immediately below, is the same piece, but showing a perpendicular in place of a lateral view. Dr. Barrett had it made to show the way the added teeth were held in place, *i.e.*, by a wire inserted in a hole drilled through. The band is not separated and soldered together, but is all one band, simply pinched together at the points at which it appears to join, and then held by a string. The centre one in this figure is the ancient Etrurian specimen just described. The one just at the left of this is of the same period, but about 150 years later. The others are carved ivory specimens, etc., belonging to Dr. W. C. Barrett and myself, some of which I will show you later.

Dr. Barrett, at a recent meeting, showed other specimens of unusual interest, as they bear unimpeachable testimony on some interesting points connected with the teeth of man ; he says : " Dentists of to-day usually entertain the idea that the prevalence of disease of the teeth is to be attributed to the altered methods of living, to the modes of cooking food, to change in manner of life, etc." Some years ago Dr. Barrett examined some 2,000 ancient skulls more especially with reference to dental disease. He says: "This examination at once demonstrated conclusively that all the diseases of modern life, except syphilis, were as rife in ancient times as they are to-day." The teeth exhibited showed the existence of pyorrhea alveolaris 750 years before the Christian era.

Next was shown an ancient Phœnician engraving representing a dentist extracting a tooth from the left side of the jaw of a Scythian king, one Pairisadies by name. This engraving was found upon a Scythian vase discovered in an immense tumulus or buried mound to the west of Kertch, a small town on the Crimean Peninsular. Cigrand quotes Dr. Eames, who says: "The richest of the numberless tumuli so far opened is the one called the Koul Oba, which was examined under the Russian Government. This was a royal tomb, and in a spacious apartment, constructed of large blocks of stone, were found the mouldering remains of the king, his queen, or favourite wife, his servants and horses, and surrounded by his treasure.

"Near the splendid wooden sarcophagus, of the kind, were the remains of his queen. On her head was a mitre-shaped diadem, and at her feet a vase of electrum, upon which was embossed a frieze of characteristic episodes of Scythian life. Upon the vase are four groups in excellent *repoussé* work, giving incidents in their life. The king is clad in Scythian costume, a tunic belt to the waist, and full trousers tucked in the boots. In one group he is listening to a report of a warrior kneeling before him. In another, he is bending a bow; in a third, his wounded knee is being dressed, and the last, the engraving before you." This dates 310 B.C.

The renowned archeologist, Belgoni, says: "It is said the Greeks wore false teeth of Sycamore wood, which were held in place by ligatures of gold fastened to the natural ones, and that many of the natural ones were filled with a clay-like substance which appeared to be very durable." The tenth of the celebrated Greek laws of the "Twelve Tables" relating to funeral ceremonies, has, besides others, this direction: "Let no gold be used, but if any one has his teeth fastened with gold, let it be lawful to bury or burn that gold with the body." That dates back some 450 years B.C.

There are many cases of ancient pieces of prosthetic work in various museums and private collections throughout this country and Europe; but time prevents me from going more into detail.

There are many claims of teeth having been found filled with gold among the ancient Etruscans and Egyptians, but Dr. Barrett says: "There is much, that I am entirely satisfied, is false. For instance, I have never seen any reliable testimony whatever that prophylactic dentistry—filling teeeth for preservative purposes—or any of what is now called 'operative dentistry,' was practised until within a comparatively recent period. The assertion that ancient Egyptians filled their teeth rests upon the error of unprofessional observers who mistook the gilding and ornamenting of the teeth of the dead for gold fillings." He further says: "Gold was never used, in my belief, until within a couple of hundred years or even less, and a great responsibility rests upon those who have accepted unworthy and unsubstantiated testimony for facts, and recording it as history."

The majority of the specimens which I show you are carved from hippopotamus ivory; there are three made from elephant ivory. Dr. Barrett says: "Hippopotamus ivory was mostly used, as it was harder, but in either case, could not be worn more than three years. If left out of the mouth it cracked; or 'stunk' with a stench peculiar to itself if worn continuously."

Wishing to become better acquainted with these specimens, I was referred to Dr. Barrett as the one probably best fitted to give the needed information. He very kindly consented to do so, and I sent them on to him, and am greatly indebted to him, not only for this, but also for other information pertaining to this subject. I would like to say here, that although Dr. Barrett was entirely exhausted from his labors in three colleges, aside from his literary work, his practice, and other duties, he was ever ready to give freely of that which he had labored years to obtain, all for the good of the profession to which he has devoted his life, and the associates whom he loves, and that includes every worthy dentist.

These specimens range in age from 100 to 150 years. They were mostly gathered by my brother, Dr. H. C. Ledyard, who spent much time in travelling, and always took a lively interest in all antiquities, particularly those pertaining to his beloved profession. They were mostly gathered in New Zealand, the Phillipine Islands, China and Japan.

This is a full upper set carved from walrus tusk Dr. Barrett says: "This was the kind of work used before swaged metal plates came into use. At this time they did not take impressions and make plaster casts to which to conform the plates, but they carved and fitted them to the mouth directly. The prosthetic work consisted of single teeth and partial or full plates thus curved ; partial plates were necessarily tied to the remaining teeth." This is one of my oldest specimens. It was made before 1787. As it was not held in place by the spiral spring, I have not been able to find in what manner this plate was secured ; but it must have been by a spring of some kind. This was carved from one solid block of walrus tusk ; it has been worn but little, as it is not discoloured.

This is one of my finest specimens ; it is a full lower set. Human teeth are set on with metal pins as far back as the molars, which are carved from the solid block. You will see the metal post still remaining where the human teeth have been lost. This specimen shows great skill and workmanship and is about 150 years old.

This shows a partial lower set, carved from the same material as previously shown. It was not tied in, but was held in place by cement, filling counter sunk sockets, made in the plate by the side of the natural teeth. The cement is quite hard and of a yellowish appearance.

This represents one partial upper and two lower plates. They are of elephant ivory ; two have never been worn. The small piece has, and was, probably fastened to adjoining teeth.

Here is a lower plate, made since the discovery of the spiral spring by M. De Chemant in 1787. It has been much worn, and originally had natural teeth set on with pins ; all are broken off and the case worn in its present condition probably to hold the upper in place.

Cigrand says : "To a German dentist, Dr. Meare by name, we should be grateful for inventing the process of filling teeth with gold leaf." In a German volume, published in 1541, entitled, "Medicine for the teeth," he says : "First scratch and clean with a fine file or chisel, knife, or any instrument, the hollow parts attacked, and fill with gold leaf."

In 1759, Ambrose Parr (familiarly known as the "barber" dentist), discovered the possibility of successfully transplanting teeth ; this practice, however, Dr. John Hunter most emphatically denounced. He says : "Transplanted teeth can never recover life," etc. Following this eminent Frenchman came others, all of whom contributed to the advancement of dentistry. Thus Hemard, a

French dentist, manufactured, in 1622, ivory dentures; Petrie, a Parisian dentist, advertised himself as a specialist on 'Implantation of Teeth.' (Cigrand), In 1735 the French Academy of Science announced the discovery of caoutchouc, which, in various forms of preparation, was used by dentists as a filling material."

In 1728 Dr. Fauchard proposed, as a substitute for natural teeth, such as could be made of porcelain; this, however, was simply a suggestion for some future inventor. It was left for M. Dubois De Chemant to so perfect the art; and to him is due the credit of bringing porcelain teeth into general use. I have in my possession a very interesting work published by him in 1797. The title page is difficult to read; but it is most interesting to see with our own eyes the work of that master mind that has done so much for the dental art. This work can be seen, together with other specimens which I have on exhibition here. This, you will see, is "A Dissertation on Artificial Teeth in General, exposing the defects and injurious consequences of all teeth made of animal substances, the corruptibility and dangers of which are at present acknowledged by the faculty."

"The superior advantages of teeth made from a mineral and incorruptible composition are recommended by the faculty and Royal Society of Medicine by the Academies of Science and Surgery, and by many eminent physicians and surgeons in Paris and London, by M. Dubois De Chemant, Surgeon of Paris, residing at present in London, and inventor of those teeth for which he has obtained His Majesty's Royal Letters Patent dated 1797."

Fig. 10 is from M. De Chemant's book just described, and represents some of his work; all of these pieces are made from his mineral paste. You will notice the spiral spring in the full set, also how he has arranged it to hold the upper plate in place by resting a frame over the lower teeth. The advantages of this spring are that it gives more freedom to the jaws, etc. Among the eminent men of that day who were using these mineral teeth was the renowned surgeon John Hunter.

A photograph from a page in Chemant's book, "On the Advantges of Incorruptible Mineral Substances to Make Artificial Teeth," was shown, as follows:—"Being convinced of the multiplicity of accidents occasioned by teeth of animal substances, and surprised at the little progress which art had made in this branch of surgery, I have dedicated myself entirely to it, and have made it the object of my particular researches. I have multiplied my experiments without ever having been discouraged by the jealousy of those whose interest it is to continue abuses, and to propagate the error of so pernicious a practice, nor by the considerable expenses of the processes necessary to perfect the discovery. I have found among minerals, durable and incorruptible substances, on which neither the air, the saliva nor the active parts of the food made any impression, and on which even the strongest corrosives have no effect. This matter is susceptible of the forms which are most proper for the important functions which are wished to be re-established.

"In short, after after many researches, I have at last discovered means to make a mineral paste which is ductile and susceptible of receiving the just and exact impression of the gums and pieces of teeth without the need of extracting the latter. I have succeeded in giving to their substance, by a practical process, a degree of solidity which renders it capable of resisting the greatest efforts without breaking or producing any of the effects which may follow from breaking or from the exfoliation of the animal substances hitherto employed.

"The colour which is given to this composition is unalterable; the colour of gums can be exactly imitated, which is of utmost importance, the deficiency of the jaws remedied, and by imitating on the substance, formed at pleasure, the original colour which is natural to the parts necessary to replace, a degree of perfection is obtained hitherto unattempted."

This is a report of the Academy of Science concerning the Teeth and Sets of Teeth, of the New Composition on M. Dubois De Chemant, extracted from the Registers of the Royal Academy of Sciences, dated the 10th of June, 1789.

M. Darcet and I have been charged to examine the teeth and sets of a new composition which M. Dubois De Chemant has presented to the Academy, and to give an account of them. The company has been able to judge, as we have, that those teeth and sets very nearly imitate nature, as well by their form and colour as by the portions of artificial gums which support them, and to which De Chemant also gives a very great likeness to natural gums, but what merits for them a considerable preference beyond all those which have been composed hitherto, is that they are of hard substances upon which the saliva and particles of food which remain in the mouth have no effect ; whereas, the others, made of animal substances, and little resembling natural teeth, are easily spoiled, acquire a dirty colour and contract a smell as offensive as it is prejudical to the health. The matter which De Chemant makes use of is a mineral paste to which, after many efforts, he has found means of giving a natural colour, like to that of the teeth which he means to supply. He can mould it into any form so as to make whole sets, half sets either for the upper or lower jaw, portions of sets—when there remain above or below teeth which may be preserved—single, double, treble or quadruple teeth, as necessity requires. The whole sets are put in motion by means of springs of De Chemant's invention, which are very different from those used heretofore, and which not only separate the parts when the jaws are distended, but allow the side motions. These springs are applied to both sets, even to the upper ones, in a manner as simple as it is ingenious. A mechanism, equally simple, joins the parts of sets to the natural teeth, which remain ; and single, double and treble teeth fit with the greatest facility because De Chemant has found means of boring his paste so as to place pins in them and to make any slides he pleases.

His manner of taking measure of the teeth which he intends to replace adds greatly to the merit of his invention. His process is such that each piece is moulded, as it were, for the place which it is to fill ; and as for the whole sets, half sets or any other portion whatsoever, their base receives and surrounds the edges of the gums, or the part on which they are applied, so as to render their position very solid, and to prevent the pain they may otherwise occasion. By this process he can preserve as long as he pleases the moulds of all his pieces, and can take very exact and perfect measures of persons at a distance, whom he never saw, and, provided he be informed exactly of the colour of the remaining teeth, he is sure to send pieces which will fit with the greatest exactness, as well as if he had taken the measures and placed the teeth himself.

M. De Chemant's paste is very solid ; it cannot be broken between the hands without employing great strength.

The Academy will no doubt permit us to conclude, from what has been said, that the artificial teeth and sets of teeth of M. De Chemant deserve being approved by it, and that it should be proper that history should mention the happy application he has made of a hard and incorruptible matter to an end so useful as that of supplying the want of lost teeth.

(*Signed*) D'Arcet and Sabatier.

At the Royal Academy of Sciences, June 10, 1789.

I certify the present extract is agreeable to the original and to the judgment of the Academy.

(*Signed*) The Marquis de Condorcet.

Paris, June 21, 1789.

The split bean teeth here represented, are the first put up with pins, baked in the mineral paste ; the glazing is only on the labial surface. It is held in place by being soldered to a metal post, as seen in this old skeleton plate now before you. This is also a very fine specimen of its kind and was made before impressions were taken.

These are the old English clasp plates, swaged gold, with the old English tooth soldered on to a flat gold backing. These are of comparatively recent date.

This is a swaged clasp plate, but has human teeth set on metal pins, and has been much worn. The workmanship is very fine.

The Chinese carved teeth, from bone or ivory, to fit the vacancies in blocks of one, two, three or more, as the case required ; drilled holes through them and tied them in place with ligatures. In two of these specimens the cotton string still remains. They are a great people for large teeth, as these specimens will demonstrate. They have been making them for ages. From the time of the first American dentist, Dr. Joseph Lemaire by name, who came to this country from France in July, 1778, down to the present, there has been one steady onward upward development ; more particularly is the case in the last forty years. After the taking of impression was devised the making of swages and the striking up of metal plates to fit the mouth became common. Here is a set of old French teeth mounted on silver, also a silver swaged plate with block teeth ; the molars and bicuspids are in one block ; this has a soldered rim and is very nicely made. Even at this time they retained the clasps to hold the partial plate and used the spiral spring to keep full sets in place, but these are suction plates. Dr. Barrett sent me these teeth and says : "They are the first mineral teeth made by Hayes, of Buffalo. They were about the first gum teeth made ; the earlier teeth had none. About the same time Stockton devised the same thing and each placed them on the market without the knowledge of the other. Stockton's pivot teeth were used when I came into the profession, and for some time since, but have been superseded by crowns and metal pivots. To a degree, Bonwill's crowns first crowded them out, and since others have been devised."

Stockton was the first to put artificial teeth up in sets, as before that a promiscuous lot of all kinds and colors were given a dentist to select what he wished, and to match as best as he could. He was the greatest of all who manufactured teeth. He was the uncle of S. S. White, and the latter took up the work where the former laid it down. Dr. Barrett says: "The earliest dentists of that city employed calves' teeth largely, obtaining them from the markets. Human teeth could also be bought. I have the first moulds for the forming of artificial teeth ever made, by Hayes, and they are really nice."

This is a wooden plate, Japanese work, and is for a Japanese widow. It is made entirely of wood and blackened. It has been worn, as the plate is nearly broken in two and was repaired with a piece of steel wire, part of which still remains. They are inexpensive, ranging in price from one to five dollars. The cheaper sets are all of wood; but in the more expensive the teeth are made of bone, ivory, stone, etc., set in wood and held in place by ligatures. When the Jap made this case he was probably seated on the street corner, but now you will find regularly equipped dental offices using up-to-date methods. I am greatly indebted to Dr. W. A. Bryant for a very fine specimen of Japanese work, a wooden plate with teeth all in place, which are made of soapstone.

This plate is about eighty-five years old. It is made of ivory, in blocks of three, with a flat groove cut in the palatal surface, through which passes a flat silver wire. The holes are drilled through block and wire and held in place by wooden pins. It is a very crude work and was made in Philadelphia for a great aunt of mine, whom I can just remember.

This is a plate made for the same person, after the one just shown became useless. This you see, is an improvement, showing a swaged plate with the old English tooth, and was made about eighty years ago.

I have necessarily omitted much that I would like to present this evening, but enough has been said to show that we are in the greatest age of progress that the world has ever known, and that dental science is keeping well abreast with the times, and in such a way as to command the respect of the civilized world.—*Items.*

A PERFECT FILLING FOR THE POSTERIOR TEETH.

By Dr. James M. Magee, St. John, New Brunswick.

That the insertion of a perfect filling is of paramount importance to the majority of dentists, no one will question. The perfect filling for all classes of cavities has not as yet been discovered. To be perfect, it should be easily manipulated, easily introduced, easily finished. It should be readily adapted to the uneveness of the cavity walls, and be the colour of the tooth. It should be a poor conductor of heat and cold, and be insoluble so far as the fluids of the mouth are concerned. Furthermore, and not least of all, it should retain retain its shape under stress of mastication.

Except for colour, amalgam combined with cement as a lining for the cavity, fulfils all of the above requirements. Therefore in parts of the mouth remote from view it is a perfect filling.

The best results are obtained by using freshly filed alloy, and almost any of the alloys on the market is good enough, provided it does not contain too much tin. In all deep cavities where some of the partially decalcified dentine is left, it is best to varnish before using the cement.

In all cases where a contour is necessary, if practicable, I use the rubber dam, and always a matrix.

Let us assume, for illustration, a large cavity in the approximal surface, involving the grinding surface of a molar and having the posterior cusps somewhat undermined and side walls frail. The method which I employ is as follows :—

First prepare so much of the cavity as conveniently may be, for the removal of filthy deposits, and the easy application of the rubber dam. Adjust the dam on so many of the teeth as will permit easy access to the cavity, and dry the cavity thoroughly. Break down all the cervical wall removable with a flat stout instrument, using the adjacent tooth as a fulcrum. Often a cavity will really extend one-eighth of an inch or more nearer to the alveolar process than at first suspected. Break away all frail edges, file and if necessary sandpaper. The only use I make of the engine in very extensive cavities is in following out sulci, and smoothing the cavity edges with sandpaper discs after trimming. After the margins are prepared, remove the remainder of the carious structure and varnish dentine. Fashion a piece of thin sheet steel, such as may now be procured at the dental depots, to a contour of the lost portion of the tooth, with pliers, allowing it to extend a little higher than the tooth, and lay it aside.

Mix a little amalgam to a quite plastic lump and flatten somewhat. Mix cement to a thick creamy consistency and apply quickly, smearing it all over the cavity. Introduce the amalgam and quickly work it with ball burnishers and flat instruments till the cavity presents only a metallic lining. It makes very little difference how much cement remains under the amalgam, provided there is the merest film around the edges. With a sharp instrument thoroughly clear away the edges and fit in the matrix. Warm and pack a little gutta-percha around the matrix at the gum line to hold it firmly against the cervical margin. Mix fresh amalgam, and squeeze out all the mercury possible. Cut it up and pack with ball burnishers, using as much pressure as possible. Mercury will soon be worked to the surface. Remove this as often as it appears, and add fresh amalgam. As the filling progresses it will be found necessary to brace the ends of the matrix to keep them in place. Nothing will hold the ends quite so satisfactorily as the thumb and finger of the left hand. As pressure is made by the packing instrument, the natural resistance of the opposing fingers makes a perfect brace.

After the filling has been made somewhat higher than the tooth, carve the top of the filling until it is shortened about the height of the tooth. Remove the gutta-percha by sticking a heated instrument into it. Bend back the matrix ends, and if the amalgam has been properly packed there need be no hesitation about grasping one end with pliers and pulling out sideways. Carve filling to perfect contour with the sharpest trimmers, and burnish tin foil on to the filling to absorb the mercury, continuing until the tin will take up no more. Smooth the approximal surface by passing a waxed silk with pumice, or other polishing girt, between the teeth, and after making sure that no loose particle of the filling is left at the cervical border, remove the dam. Carve to a perfect articulation. Ten minutes polishing at a subsequent sitting will make such a filling "a thing of beauty and a joy for ever." It will defy caries.

Where the patient's time was limited, I have frequently been obliged to fill at a single sitting, cavities in the anterior and posterior surfaces of a molar, both of which required contouring. In such cases after the first is finished, I separate the other space with the Perry separator and insert the second filling. The only effect of intense pressure on the first filling is a little brightening of the surface, due to mercury. One thickness of tinfoil absorbs all that appears. This is a test severe enough for any amalgam filling.

Should the cavity extend so far beneath the gum margin that it is impossible to carry the dam beyond its edge, prepare and smooth the margins, and fit a matrix, smoothing its sharp corners and edges. Slip it to place and apply the dam. Then proceed with gutta-percha to hold the matrix against the cervical edge, just as if the dam had been placed on first. The only difference in succeeding steps is that more care must be used in getting such a thin layer of cement at the cavity edges as gives the best results, and in removing every vestige of cement from the very edge.

In ninety-five per cent. of amalgam fillings put in by me I use a cavity lining of cement. The benefits of cement are fivefold : (1) it retains the filling ; (2) it preserves the colour of the tooth ; (3) it prevents the metal from transmitting sensations of heat and cold to the pulp ; (4) by its use we save valuable tooth structure, as owing to its adhesive properties we do not require so much cutting for anchorage ; and (5) if caries should occur in any part of the tooth near the filling and should extend to the filling, it progresses less rapidly than if no cement had been used. Amalgam in contact with dentine in a live tooth discolors it, and by virtue of that very discoloration preserves it, but no one has yet seen the same happy effect follow the contact of amalgam with enamel. There may be a slight discolouration but there is also a slight disintegration and as a result the tooth is an easy prey to caries all along the border of the filling. I care not how near the cement may be to the edge, in fact I take pains to plaster cement all over the cavity, but I also take the precaution of removing every particle from the very edge, after packing my first layer of amalgam, so that when the filling is finished there will be no cement to dissolve out.

In cases where the pulp has been removed, the support received from the cement is of the greatest benefit, because the longer a tooth is pulpless, the more brittle it becomes. Amalgam directly in contact with dentine in a pulpless tooth does not discolor with the result of preserving it, as in the case of a live tooth, and if no cement is placed under it, disintegration takes place sooner or later.

In cases where the teeth are firmly fixed, secure space by separating previously to the date set for filling if possible, otherwise great difficulty will be experienced in getting a proper contact with the adjacent tooth. In cases where the side walls are broken down it is always safe to secure space, but if the side walls are still standing and enough of the tooth remains to keep a correct contact between it and its neighbour, it is not necessary in young subjects to separate. The pressure of amalgam against the matrix is sufficient to counterbalance the little space taken up by it between the teeth.

In my experience the most humane method of securing space is by the use of the Perry two-bar separators. I have no wish to advertise these articles for the sake of the dealers, but if a greater number of dentists realized the wonderful benefits following their use, their patients would receive the blessing, and they would receive the patient's thanks. I had one of these separators ten years before I had demonstrated to me the proper use of it. Immediately I bought the others of the set, and since that time have had endless satisfaction. Separation may be secured in many ways, but with the exception of the tedious process of filling the cavity with gutta-percha and allowing it to remain for some months, there is nothing will move the teeth apart so easily and painlessly, and do so little damage to the teeth and surrounding tissues as the Perry separators.

Many forms of matrices are used and all have their advocates who obtain good results, but for contouring the approximal aspect of a tooth, standing in correct relation with its neighbours, the only universally satisfactory matrix is one cut and fitted to the particular case in hand.—*Items*.

ERUPTION OF CENTRAL INCISOR IN THE NASAL CAVITY.

By R. Keith Common.

This case showed a remarkable result of misplaced alveolar process after an operation for cleft palate. The patient—a boy of 10 years—was operated on twice by Sir George MacLeod, of Glasgow, first when three months, and again when 15 months old. The fissure, which extended through the lip, hard and soft palates, was remarkable for its width and depth, and there was considerable difficulty in overcoming the tension in uniting the lip. The alveolar process was drawn together, but no attempt was made to close the parts behind, as it did not promise to benefit his speech. In a year or two an obturator will be made for him and this is expected to give a better result. In approximating the edges of the process, that part containing the right incisor had been tilted upwards, and of course changed the direction of the growing tooth. Soon after the second operation a small hard nodule was felt in the floor of the right nasal cavity, and which was thought to be bone, but proved, after it dropped out, to be the right temporary incisor. The permanent tooth made its appearance only a few months ago, and its eruption was very rapid, taking an upward and outward course, with its mesial edge anteriorly. On the removal of the tooth—which came away very easily—its appearance showed that its formation must have been disturbed at the time of the operation ; a distinct depression encircles the crown about its middle, giving the appearance of a united fracture.—*Journal of British Dental Association.*

Reviews.

TIN FOIL AND ITS COMBINATIONS FOR FILLING TEETH, by HENRY L. AMBLER, M.S., D.D.S., M.D. Philadelphia : S.S. White Dental Manufacturing Company ; London : Claudius Ash and Sons.

A useful little book containing an account of the use and preparation of tin foil.

THE COMMERCIAL USES OF COAL GAS, by THOS. FLETCHER. Published by Fletcher, Russell & Co.

A little book containing many useful suggestions on the use of coal gas. It consists largely of papers first published elsewhere and covers an immense field, from baking pastry to preventing fog.

PATENTS FOR INVENTIONS — ABRIDGMENTS OF SPECIFICATIONS. Class 81. Medicine, Surgery and Dentistry. Period, 1884—88. Published by the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C.

This is one of a most valuable series now being issued by the Comptroller-General of Patents, &c. These abridgments are intended as a guide, and the would-be patentee or others can obtain a printed copy of any specification in detail at an inclusive price of 8d. through any post office by a special postcard (Patents Form Ç 1). The "Abridgments" are arranged in 146 classes, and hence cover an enormous field. An index key (price 1s.; parcel postage 5d.) can be obtained. The price of the above mentioned volume is 1s.

CORRESPONDENCE.

[We do not hold ourselves responsible in any way for the opinions expressed by our correspondents.]

GUY'S HOSPITAL.

TO THE EDITOR OF THE "DENTAL RECORD."

DEAR SIR,—In your DENTAL RECORD for October you state that some of the Dental Hospitals have a Dental Society attached to them, but you do not state that the above hospital possesses one.

It however does, which has been in existence since October, 1894. The Society holds its meetings the second Tuesday in the month, at 4.30 during the Winter Session, *i.e.*, October to March. The Society awards a prize of £5 for the best paper read during the Session.

Hoping you will state that we do possess a Society on other occasions.

Faithfully yours,

REGINALD UMNEY,

Hon. Sec. Dental Society.

[We cannot find the statement referred to, but we have pleasure in giving prominence to the Secretary's statement "that we do possess a Society on other occasions."—EDITOR.]

THE DENTAL RECORD.

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Original Communications.

PLASTIC FILLINGS.*

By L. F. BARTON.

MR. PRESIDENT AND GENTLEMEN,—Plastics, as you know, are divided into three main groups, I. Amalgams ; II. Osteos ; III. Guttaperchas, and I shall consider them in that order ; but before doing so I wish to describe to you a filling which no dentist yet has ever inserted into a tooth, viz. : The Ideal Filling. This is an imaginary sort of stopping which has virtues that no material hitherto invented possesses ; one day, perhaps, the secret may be discovered and *then* dentists will be quite happy.

Let me briefly run over its properties. It is hard and tough enough to resist attrition. It is a non-irritant and a non-conductor, it is easy of adaptation and when inserted it keeps its shape and form. It has no chemical action in the mouth, and, lastly, it resembles in colour the natural tooth. Of course, as I said before, this is only an imaginary stopping, but I will ask you to keep it in your minds, as I shall often refer to it when I describe the different kinds of filling materials and consider how near perfection they are.

An amalgam may be defined as an alloy of mercury with one or more metals in varying proportions. The process of combining different metals with mercury to form an amalgam was known ages ago, almost from prehistoric times, and I cannot give you a date, but I have read (I do not know whether my authority was a reliable one) that mummies have been found whose teeth contained fillings which appeared to consist of an amalgam of some sort ; this being true, it only bears out the saying that "there is nothing new under the sun." Amalgam is a filling which is of enormous value, and, since the improvements in its manufacture, thousands of teeth are annually saved from extraction; consider for a moment what wrecks of teeth can be built up into good solid serviceable masticating surfaces by its use.

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* A Paper read before the Students' Society of the Dental Hospital of London.

The metals which have been used in making amalgams are numerous, and comprise gold, silver, copper, tin, platinum and palladium, and each of these gives to the amalgam a special property.

Silver is used in most alloys: its advantages are that it renders the filling hard, and in a great measure lessens that tendency to contract on hardening which all amalgams possess to a certain degree. But the great disadvantage that silver has is that when the filling sets it turns a dark colour and in addition to this it blackens the tooth, a result which, of course, renders it useless as a filling in teeth which are near the front of the mouth.

It is said that the way in which the silver darkens the tooth is by the formation of sulphide of silver, which is formed by the silver coming into contact with the sulphuretted hydrogen in the mouth.

Copper is the metal which in connection with amalgams is perhaps of the most value; it diminishes shrinkage, hastens setting, and has a preservative action on the tooth itself. The great disadvantage, however, is that it turns a deep black colour on setting, and in addition it blackens the tooth in the majority of cases. It is a very curious thing that some teeth escape discolouration, and I believe that no one has yet assigned a reason to it. At any rate the blackening of the filling itself is enough to exclude its use in any teeth that may be visible when the patient opens the mouth.

It makes a good tough filling, and possesses the curious property of hardening the dentine to a surprising degree, so that even when a filling has shrunken away from the edges of a cavity caries but rarely invades the exposed dentine: this is a phenomena that is most interesting, but I believe that no one knows the reason for it, and so we must be content with the fact alone.

Tin prevents discolouration and reduces the conduction of the amalgam, but unfortunately it causes slow setting and great shrinkage, it also renders the filling weak at the edges. So it will be seen that the advantages are greatly outweighed by the disadvantages.

Platinum, in an amalgam, is of great service in adding strength and rapidity of setting.

Gold renders the amalgam more easily worked and assists in maintaining a good colour. It greatly reduces shrinkage and renders the filling sound at the edges; but if more than four per cent. is used, it renders the filling brittle.

Palladium, when combined with mercury, forms a very useful stopping in certain positions. It does what no other amalgam yet made does—it expands on hardening. Now this property of expansion must be borne in mind, for it would never do to insert it into a big cavity with weak walls, as the tooth would inevitably be cracked, but in small cavities, in a good sound tooth, it may be used to great advantage, particularly in those very sensitive teeth which we often meet with, where it is next to impossible to cut a cavity capable of retaining the ordinary amalgams: the expansion of palladium rendering the usual careful shaping unnecessary. The amalgam does not stain the tooth substance, but the filling itself turns jet-black and so therefore it must not be used near the front of the mouth. Another curious thing about this amalgam is that when it is mixed with the mercury a very active chemical union takes place so that great heat is evolved, and in some cases an explosion takes place.

It is very quick setting, so much so that if the operator is not careful, it will set before he has inserted it into the cavity, therefore it should be used very soft.

Having thus spoken of the properties peculiar to individual metals let met briefly draw attention to a few of the amalgams in general use. First and foremost, of course, must come "Sullivan's" copper amalgam: it is one of the oldest we possess, but, in spite of all rivals, it remains to us this day as a good sound filling, the best, when used in the right plate. It is generally supposed to be made of three parts copper to six of mercury.

Next on my list comes "*Sub-marine*," one of the very best of amalgams. It is specially adapted for use in cavities where the cervical edge is near to or level with the gum, as it has good edge strength, and is not affected by the saliva, as Sullivan's is. This filling has a drawback, inasmuch as it turns grey or black, though not staining the tooth in any way. It is perhaps a little more difficult to manipulate than most other amalgams, as it is apt to crumble under the instrument, if used as it ought to be, with all the mercury possible by hand-pressure alone expressed from it. (By "hand-pressure alone" I do not mean that a napkin should not be used.)

"*Contour*" is an amalgam which keeps its colour, and so is very useful in stopping approximal cavities in bicuspids, but, owing to its tendencies to shrink, it is a filling which is very unreliable, and it should only be used where it is impossible to employ other amalgams.

"*Flint-edge*" is an amalgam which contains a small percentage of gold. It does not turn colour and does not stain the tooth. I have had but little experience of it, and so cannot personally vouch for its qualities; some people speak very well of it, while others state that its edge-strength is poor and that it is too brittle.

Let us now sum up the advantages and disadvantages of the amalgams as a whole and compare them to our ideal filling. We have the requisite toughness, strength and adaptability, three most important things. Amalgam also causes no irritation in cavities where there is a sufficient layer of good sound dentine between it and the pulp; but here unfortunately the likeness with the ideal filling stops. All amalgams in a greater or lesser degree tend to alter in shape on hardening, and this is due to a tendency which they have to assume a spheroidal shape, the change beginning when the filling sets and continuing for months; I shall later on try and describe to you how this may to some extent be obviated. Lastly, no amalgam yet invented pretends in the least to resemble in colour the natural tooth; some, as I said before, do not turn black but keep their original colour, but this colour at best is but a poor attempt, as it resembles silver more than anything else.

Now to pass on to the methods of using amalgam. All must be well acquainted with the ordinary kinds of instruments in use, so I will only allude presently to one or two special ones which may be of service.

First of all to describe the proper shape to cut the cavities. There is one golden rule which should always be remembered—remove all thin overhanging edges. Now there are two reasons for this, first it is very difficult to remove the decay from under them, and secondly, if the cavity be on the masticating surface of a tooth, the edges will of a certainty be broken away in a short time.

The edges must be square-cut; if they are bevelled and the amalgam brought over them, as in using gold, the amalgam will be sure to chip away and leave a rough edge, which will cause decay by affording a good lodgment for food.

The cavities need but little undercutting, no filling can possibly come out if the base of the cavity be a trifle larger than the aperture. It is best also to square up the sides of the cavity with a good fissure bur or enamel chisel, leaving, however, no sharp angles, as these are difficult to fill properly. The greatest care must be taken—and this applies to all fillings—to get a good sound cervical edge; this is the weak point, as here it is that the food lodges, and decay quickly follows if the greatest care be not taken to secure a good edge.

Now, as to the insertion of the filling. I will take as my example a medium sized insterstitial cavity in a molar. Personally, I always use a matrix when there is contouring to be done, though some men do not like them, saying that they can do just as well without the trouble of putting one on; the best kind of matrix is, I believe, Lennox's. Having adjusted our matrix, taking care beforehand to exclude the saliva by the use of a napkin or rubber-dam, we proceed to put in the amalgam. Should the nerve be nearly exposed, or if the dentine is sensitive, it is best to line the cavity with a little osteo, using "artificial dentine" in the first case and ordinary oxy-phosphate in the latter. The mercury must be well expressed from our amalgam by squeezing it in a napkin, dividing the stopping into two parts, one of those parts to be made drier than the other. The reason of this is because it has been found from experiments made by Mr. Kirby, that if the top of the filling be built up of drier amalgam than that used below, the stopping does not shrink so much: the effect being brought about by the excess of mercury in the bottom travelling to and permeating the drier amalgam on the top, and so rendering the amount of mercury equal all through the filling.

Now let us put in our first piece of the softer amalgam, and an amalgam carrier will be found of great service; there is one kind made by Ash, which is a very good one, it has a sort of piston inside which shoots out the stopping on pressing the end, and for filling distal cavities in molars it is invaluable.

The stopping must be well worked into place, and a burnishing movement with the plugger is a very good method. It is best to use a fairly small instrument when beginning the filling, as this ensures any little accidental angles in the cavity being filled. Having filled the cavity, using plenty of pressure, clear off the surplus mercury, either with a flat burnisher or by means of a tin cylinder, which will quickly soak it up. Some say that by using the tin cylinders the surface of the filling is rendered rough, but even if that is so I can see nothing against their use, providing the filling is smoothed off afterwards with a pledget of cotton wool.

Now the matrix must be removed and great care must be taken lest in doing so a part of the amalgam be broken away.

The patient must be warned on no account to close the mouth till permission be given, for if the filling is too high, the opposing tooth will inevitably crush down the amalgam and the whole stopping be ruined. The top of the filling must now be shaped up, and on telling the patient to close gently, if there is any excess of amalgam, it can at once be detected. It is imperative that a true bite be given, and the reason for this is obvious, for if the operator does not recognise a wrong bite, and trims his filling up to it, directly the right bite is given the filling is ruined. It is a very good way when doing amalgam that will receive the bite of an opposing tooth to get the patient to close the teeth several times before the filling is begun, and the operator can then remember what the true bite was like when finishing the filling, and there will be no danger of the catastrope I mentioned.

When the amalgam is an interstitial one, a good way of smoothing up the sides is to take a narrow strip of rubber-dam, moisten it and pass it backwards and forwards between the teeth, and in this way a perfectly even surface can be obtained ; and lastly, let me emphasize the great importance of seeing that the amalgam does not overhang the cervical edge in the slightest ; I believe that no matrix, however good, can prevent this, and so the operator must go carefully to work either with a flat burnisher or by means of a piece of silk, and clear away all amalgam that projects.

Now I have said all I have to say about amalgam, as so will pass on to consider *Osteos*.

They are a most valuable kind of stopping, and although they are at best only of a temporary nature, still they are to the dentist of enormous benefit in many instances, which I will mention later.

Three varieties are in use—the oxy-chlorides, the oxy-sulphates and the oxy-phosphates.

In the oxy-chlorides the powder is zinc oxide which has been heated to a white heat for two hours. The fluid with which it is mixed is a solution of chloride of zinc. The *oxy-chloride* is of no use as a stopping, as it sets very slowly, is washed away very easily, and causes great irritation to the pulp ; the only use to which it is put, and that only occasionally, is to fill root canals. I do not propose to allude to it again in my paper.

In the *oxy-sulphate* the powder is composed of a mixture of calcined sulphate of zinc and oxide of zinc. The fluid used in combination with it is a solution of gum arabic. This osteo is of no use as a filling, it being far too soft and soluble, but it is of great service in many ways ; in cavities where the pulp is nearly exposed it may be used with great advantage to form a floor on which to build an amalgam, as it will prevent thermal changes being conducted to the pulp by the metal, and at the same time it does not itself irritate the pulp, as is the case in the oxy-phosphate. It is also very useful as a temporary filling in teeth which are too sensitive to allow proper shaping of cavities, and if left in, for, say a couple of weeks, on its removal the dentine will be found far less irritable than before.

In the few cases where it is advisable to cap exposed nerves, if a little of the powder be mixed with oil of cloves and the paste thus made placed on the exposure, good results will often follow.

It remains to be seen whether the new material Formagen will prove of more use.

In the *oxy-phosphate* the powder is oxide of zinc, while the fluid consists of one of the varieties of phosphoric acid. Of all the osteo-plastics it is the most durable. It is of course soluble in the saliva, the average time that it lasts being from two to three years, though in some cases it will last even as long as ten years.

In the teeth of people who possess viscid stringy saliva it rarely lasts as long as two years, a notable illustration is the quickness with which oxy-phosphate is washed away in the mouths of children. Oxy-phosphate is of no use for masticating purposes, as it quickly wears away, but in cavities which are too sensitive to allow of a metal filling being inserted at once, it will be found very useful indeed as a temporary filling, even if it has to be used for mastication purposes.

Again, one often meets with it in front teeth cavities which are far too big for gold, both on account of the time the filling would take and of the disfigurement it would cause, these are the cavities in which oxy-phosphate is specially indicated.

It also has other uses, such as for fixing on crowns, cementing in porcelain inlays, &c., all of which add to its great value. One curious fact about the oxy-phosphate is worthy of note, viz., that given two cavities, one large and one very small, both in about the same position in corresponding teeth, if it be inserted into the two cavities, that in the larger cavity will be washed away far sooner than that in the smaller one. It is very useful as a lining for large distal cavities in bicuspids and canines.

Supposing an amalgam alone was inserted into one such cavity, the dark stopping would be sure to show through the thin wall of the tooth, even if one of the non-discolouring amalgams were used, whereas if a thin lining of osteo were first inserted, no such effect could happen. It is also of service in large cavities where there is not enough tooth-substance to ensure a good hold, if a thin layer of osteo be first put in, and then, while it is still soft, the tooth be filled up with the amalgam, a good sound watertight filling results.

Now to compare osteo with the ideal filling. The ideal filling is hard and tough, osteo, though to a certain extent hard, is certainly not tough. The oxy-sulphate, it is true, does not irritate the pulp, but then it can hardly be reckoned as a filling, but rather as an adjunct to filling. In favour of osteo is its adaptability, and also, more than any other kind of filling material, its resemblance to the natural tooth, though it really has not much to boast of in this respect, no filling has, as I mentioned before.

A few words as to the using of osteo. A very good rule is to, in most cases, employ the rubber-dam, sometimes by using cotton-wool rolls and the like it may be done without, but in the majority of cases it is best to put it on, as it renders it absolutely impossible for moisture to reach the filling, unless, of course, a puncture is made. The cavity does not require much shaping, as the osteo sticks of itself ; the edges must be left square. Carefully dry the cavity first with cotton-wool and then with hot-air or chloroform, and then proceed to put in the filling. If Harvard, which is one of the best osteos, is being used, it is best to mix it fairly stiff, as it lasts far longer than when used in a soft condition. When sufficient has been put in, leave it to become quite hard, all tampering with it when only half set is detrimental, larger portions than what are intended being dragged away if trimming up be attempted when it is in this stage.

When set hard, the filling must be carved up to shape with various instruments which may be convenient, one in particular I may mention, and that is the straight scaler which is used to pass between the teeth when removing tartar. After this, the careful use of a sandpaper disc on the engine, or, what in some cases is better, a sandpaper strip, will complete the stopping. The filling finished, it should be coated with warm paraffin wax or gum-mastic, this keeping the saliva from coming into actual contact with the osteo until it is absolutely hard, a process which, I believe, occupies a few hours.

In those cavities which have the cervical edge level with the gum it is useless to entirely fill with osteo, as the saliva rapidly washes it away at that point ; so permanent gutta-percha must be used in a thin layer all along the cervical edge, and then the rest of the cavities filled with the osteo. This operation is not at all an easy one, because the osteo is apt, in spite of all care, to overlap the gutta-percha, and when it is cut away a portion of the gutta-percha very often comes too. A very good plan to obviate this is to fill the entire cavity with osteo, and then, with a small rosehead bur, cut it away at the cervical edge, and finally fill up the cavity thus made in the osteo with gutta-percha.

Before leaving osteos, I must mention a filling which receives a great deal of praise from many people, viz., osteo and amalgam combined together. The cavities which are most suitable are those large ones that can give the stopping little or no hold. The amalgam is first mixed and after that the osteo, and the two combined together in about equal quantities. The filling is then inserted and burnished into shape with a cold plugger. Anyone who has not used this kind of filling before must be prepared for a surprise, as the fluid with which the osteo is mixed oozes up, and to the beginner it looks as though saliva had got in and swamped his filling.

It is always best to keep some of the pure amalgam to finish off the stopping with, as amalgam and osteo mixed does not give a good surface, it being somewhat granular.

Now, to take up our last kind of filling—*Gutta-Percha.* It is the inspisated juice of the Isonandra gutta, and other trees of the order Sapotacal. For dental work it is mixed with oxide of zinc and sulphide, carbonate of lime and aluminium. It is divided into two classes, viz., temporary and permanent. The *Temporary* is the kind generally used for fixing in dressings and filling cavities for a short period ; in the latter case it must always be borne in mind that possible temporary gutta-percha should never be inserted into sensitive cavities, as it seems to have an irritative effect and so renders the sensitiveness more acute.

It softens at a low temperature and is very easily manipulated, the pink kind more so than the white, the latter being liable to stick to the instruments.

The permanent variety contains no colouring matter, and is not at all easy to work, in fact, the insertion of a permanent gutta-percha is one of the operations which requires the greatest care and skill that the operator can give.

When compared with the ideal filling, gutta-percha does not appear in a very favourable light. One very great argument, however, it has in its favour, and that is non-conductibility. It is no good at all as a masticating surface, and does not make a watertight filling, but a strange thing in connection with this is, that fresh decay seldom occurs as a result of this leakage. When inserted too near the pulp it often causes the death of that organ, so here is yet another fact in its disfavour.

The special cases in which it should be used are—in the front teeth of young children, as their saliva dissolves osteos very quickly. In those erosion cavities which are too sensitive for metal fillings and whose position close to the gum-line renders osteos of no use.

Of the methods of using permanent gutta-percha, little need be said, the cavities do not require much shaping, a little undercut is all that is necessary. The cavities must be kept absolutely dry and therefore it is best to use the rubber-dam. A very good way to heat the gutta-percha is to take a penny, place the stopping on it and gently heat over a spirit lamp ; the penny will keep hot for a long period and so the operator has plenty of time to finally dry out the cavity if he is not using the rubber dam. Some object to using dry heat, saying that the gutta-percha becomes burnt, and prefer instead to heat it on a hot-water dish.

After the gutta-percha has been put in, the surplus must be removed with a very hot spatula and the surface then burnished over with a cold plugger. One method of finishing off the filling is, to take a pledget of wool, dip it in chloroform and rub it over the surface, it dissolves the gutta-percha and so the filling can thus be rubbed down to the required condition ; but the draw-back to this is that it leaves the surface somewhat porous ; eucalyptus may be used instead of the chloroform, and though it takes longer it does not harm the filling to the same extent.

Reports of Societies.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE Ordinary Monthly Meeting of the above Society was held on the 1st proximo, Mr. W. E. HARDING, L.D.S. (President), in the chair.

The Minutes of the last meeting having been read and confirmed, Messrs. C. W. Glassington, A. T. Hilder and L. E. Browne signed the Obligation Book and were admitted members of the Society.

The following gentlemen were then balloted for and unanimously elected members of the Society. As resident members :—Messrs. W. H. Dolamore, L.R.C.P., M.R.C.S., L.D.S.Eng. and Stephen Keele, L.D.S.Eng. As non-resident members :—Messrs. Norris Snell, L.D.S.Eng. and Arthur W. Turton, L.D.S.Eng.

The LIBRARIAN (Mr. W. A. Maggs) announced the following donations :—" Dental Surgery for Medical Practitioners," by A. W. Barrett, M.B. ; " Some Methods and Appliances in Operative and Mechanical Dentistry," by R. P. Lennox ; the Calendar of the Royal College of Surgeons, 1897 ; *Transactions* of the New York Odontological Society, 1896, and the " Year Book " of the United States Department of Agriculture, 1896. He also reported that Tomes's " Dental Surgery," Fourth Edition, had been added to the Library.

The CURATOR (Mr. Storer Bennett) presented, on behalf of Mr. Charters White, a specimen of amateur dentistry, consisting of a small bone plate with two crudely carved teeth representing lower central incisors. These teeth and the two natural lower lateral incisors had been bound together by a piece of silver wire. The specimen had evidently been worn for a long time, because there was a large piece of tartar beneath the little artificial plate, laying between it and the gum.

Mr. H. L. Albert asked the Society to accept two little teeth which were removed from a child 12 months old on account of the inner cusp lacerating the tongue. They were two maxillary deciduous incisors with a sort of inner cusp very largely developed. The teeth were perfectly sound, and, so far as he could trace, the influence of heredity had nothing to do with the matter.

Mr. Harry Baldwin thought Mr. Albert would agree with him, that the cusps were due to elevation of the cingulum, which was the usual means by which fresh cusps were produced.

Mr. Brunton exhibited :—

(1) A tooth (right maxillary second bicuspid) which he found it necessary to extract owing to its crowded position. As it was rather a difficult matter, before attempting the extraction of it he applied two rubber rings, and the rubber rings were exactly in the position on the tooth exhibited which they occupied when the tooth was extracted. One ring crept up nearly to the apex of the root, and thereby loosened the tooth to such an extent that he was able to remove it quite easily. It was a practice he had used for deciduous teeth, but never before adopted for permanent teeth.

(2) Two pairs of gold pluggers which he found useful, one especially for matrix work and the other for surface work ; and a pair of burnishers, right and left.

(3) Two pairs of pliers for carrying amalgam to the cavity, which he said were also useful for carrying gold cylinders.

(4) A small instrument for carrying sponges, with a slide which worked up and down to adjust it to the size of wheel required.

(5) A simple method of using silk between teeth by cutting a notch at the end of a tooth-brush.

(6) An ordinary glass spirit lamp filled with methyl alcohol used for purifying the air or annealing gold. A sheet of platina foil, crushed together in the centre and drawn up to a point at the bottom, was placed over the wick of the lamp and worked up to form a ball. The lamp was lighted and the flame allowed to heat the platina, and on the flame being put out the lamp continued to glow until the spirit was exhausted. The slow combustion of

methyl alcohol under the influence of platinum produces formaldehyde, which acts as a powerful disinfectant.

Mr. **Matheson** asked whether there was a normal degree of firmness about the tooth to which the rubber rings were applied, or whether it was loose to begin with; also whether the rings crept up entirely of their own accord, or whether Mr. Brunton helped them up, and whether a great deal of irritation was created.

Mr. **Harry Baldwin** remarked that some time ago a young girl came to him for the purpose of having her teeth regulated, and the complaint about previous treatment was that the upper central, which was being acted upon, had become exceedingly loose and painful. When he examined the case he was very much puzzled, because the tooth was still alive, and yet the gum all round the tooth was exceedingly boggy, and pus was coming down freely between the gum and the tooth. On feeling very high up with a hooked instrument under the gum he felt something like Indiarubber, and he succeeded in hauling down from near the apex of the root one of those small Indiarubber rings which were used for regulation purposes. It had been overlooked by the previous dentist who had charge of the case, and had very nearly caused the loss of the tooth. After the ring was removed the tooth gradually got tight and well again. Mr. Baldwin also exhibited two burnishers which were very much thinner than those exhibited by Mr. Brunton, and being perfectly smooth on both sides could be safely insinuated between teeth which were close together.

Mr. **Storer Bennett** narrated the case of a bleeder in which he adopted extraction by ligature, but he was inclined to deprecate the practice except in instances of severe hæmorrhage.

Mr. **Rushton** once tried an elastic ligature on a bicuspid of his own. He put it on in the morning but was very glad to take it off in the afternoon. The method, he thought, might be adopted in cases where there was an ingrowing lower bicuspid, and but little room to extract the tooth without causing damage to its neighbours. In such a case a rubber ligature might be of distinct advantage in loosening the tooth and creating a little more space.

Mr. **Brunton**, in reply, said the tooth was in such a position that it would have been a difficult matter to remove it. The second bicuspid was lying towards the palate, and he could not get anything between the teeth; seeing this, he put one ring on one day and the other on the next, and he pushed the rings well up with a burnisher. He hoped that one of the rings would find its way up and loosen the tooth, and it did most effectually. The patient went away for three weeks, and when she returned she told him she had had a great deal of pain, but he gathered that it was not unbearable.

Mr. W. A. MAGGS showed a fragment of the left half of a human mandible, with a tooth lying embedded horizontally in the bone. The ramus and the alveolar portion, as far forwards as the socket of the left canine, were in a state of good preservation. The sockets of the second premolar and the first molar, and second molar were *in situ*. The unerupted tooth was fully developed, with the apex of the root in contact with the canine socket, the crown immediately above the mental foramen, and the mesial surface placed anteriorly.

MR. CARL SCHELLING read the notes of the following case :—

MR. PRESIDENT AND GENTLEMEN : In conjunction with this communication which I have the honour of bringing before you, I show a plaster model of an appliance made by me at the earnest entreaty of a lady who very greatly desired to appear round and plump of face as in years long gone by. She first consulted Mr. Tomes, who suggested that I might find the case amusing and instructive, and so I took it in hand. She was wearing in connection with the upper jaw, five things, namely, a small piece of a vulcanite upper case, with no bands, having a porcelain incisor upon it ; two lateral pieces of the same plate ; and two very large rolls of paper, first folded and then rolled into flat spirals like small Catherine wheels.

She was very averse to my unpacking her mouth of all its varied contents for fear they might be mislaid ; but at length I got all five out, and after excising some very carious incisors, and filling some others, took an impression for a special tray. At the next visit I obtained a plaster impression of the jaw and part of the inside of the cheeks. Subsequently I tried in a plate in the usual manner, and added large masses of wax to it so as to fill each cheek as I thought they should be filled. The case was vulcanized, and the plumpers made hollow ; but when I put it in on her next visit, my patient, more in sorrow than in anger, pointed out such faults in my artistic perception of the latent beauties of her face that I cut off the greater part of my plumpers and fixing on two large masses of composition, approximately moulded to the desired shape, sent her home to perfect my attempts before her own mirror. After she had worn these for a few days I reproduced them in hollow vulcanite. I shall never forget her look of intense gratification when she caught sight of herself in my chimney glass, and though we may not all share her admiration, I ventured to bring this model here to-night in the hope that it might prove amusing, if not instructive, to the members of the Odontological Society.

Mr. ROUGHTON read notes of a case of acute suppuration of the mandible, followed by pyæmia and death :—A boy, aged 7½ years, sat in a draught at school on October 1st. The same night he complained of pain in the left side of the face. The following day he was seen by his doctor, who found the left side of the face swollen, and temperature 105°. The gum over the left lower molar region was swollen and tender, but the mouth could not be opened sufficiently to inspect the teeth ; three days later rigors occurred. On October 7th the swelling had extended down the neck almost to clavicle. Mr. Roughton saw the boy in the afternoon. After chloroform had been administered he incised the swelling in the neck ; no pus was evacuated ; but the tissues looked inflamed, and as if about to slough. On opening the mouth he found the teeth in the affected part of the jaw healthy, but the first permanent molar was quite loose, and pus welled up around it on making pressure on the gum. He removed the tooth, evacuated the collection of pus and cleaned the part as effectually as circumstances permitted. The tooth was quite sound. On October 8, symptoms of peritonitis appeared in the morning, and later in the day there were physical signs of pneumonia. On October 9, the patient died. No *post-mortem* examination was permitted. The case was at first supposed to be one of alveolar abscess. Subsequent events showed that it was not so. It was evidently a case of acute infective panosteitis followed by phlebitis and general pyæmia. Such cases were common in the long bones, but as far as he knew were very rare in the jaws. It was well known that the disease is produced by pyogenic organisms, but the path of entrance is obscure.

Mr. STORER BENNETT said the case was a most interesting one. and, as Mr. Roughton said, served to remind them how serious might the be results of what apparently in the beginning was only a very trivial ailment. Mr. Roughton had stated that the case, although at first mistaken for an alveolar abscess, was evidently not of that nature. Without wishing in any way to join issue with Mr. Roughton, he would like to know the grounds on which he arrived at that conclusion. Nothing was said as to the condition of the pulp, but it was very likely, as so often happened in such cases, that the pulp was dead. Mr. Roughton had said that a considerable amount of pus welled up around the tooth when the gum near it was pressed upon, although no pus came from the incisions in the patient's neck. He drew attention to this because it pointed to the fact that the pus was localised round the tooth itself, and had not at that time extended very deeply. The fact of the tooth not being decayed, of course, was no ground for supposing there was not an alveolar abscess. He also understood Mr. Roughton to say that there was trismus, which was one of the common accompaniments of alveolar abscesses. He did not dispute the diagnosis ; but only wished to know the grounds on which it was arrived at.

Mr. **Goadby** said a short time ago he had a very similar case. The patient was an old lady suffering from rheumatoid arthritis. She had in her mouth two lower molars and one upper root. The two molars were particularly loose and the gum in a bad condition. The upper root was fairly sound, but both the roots were troubling here, and it was decided to remove them. The patient had heart trouble and various other complications, and it was not thought advisable to give her a general anæsthetic, and they did not care to risk giving her cocaine. They therefore made use of ethyl chloride, and it was particularly on that account that he wished to mention the case. The gum was frozen and the two teeth removed. The instruments were carefully boiled, and sterilised before being used. About a fortnight afterwards it was noticed that the left side of the mouth did not heal and the right did. The first sign was a small black patch, which eventually developed into a bad condition, the whole of the gum sloughing and laying the bone bare. The old lady, who was very ill, succumbed to sapræmia. Unfortunately, he had no opportunity of making a cultivation from the case, but thought from the general conditions that the sloughing was probably due to the bacillus of malignant oedema.

Dr. **Hickman** (the patient's medical attendant) said the old lady was 69, and had suffered for some years from rheumatoid arthritis. At frequent times she had had attacks of asthma and bronchitis.

He first attended her last March. She had mitral regurgitation and a dilated heart. They did not care about giving her nitrous oxide, partly because she was so neurotic ; her friends did not care for her having general anæsthetics, and cocaine, seeing the condition of her heart, was, he thought, contra-indicated. They therefore tried ethyl chloride. About a fortnight afterwards he noticed that her breath was rather offensive, and on looking at her mouth he found that at the situation of the molar socket there was a slight black patch about the size of a split pea. Previously she had had an attack of senile dementia, and had suffered from sleeplessness. The next day her temperature began to go up, and it ran up to nearly 102° F. The whole of the gum on the inside of the alveolus was black and loose, and completely separated from the jaw. The gum was cut away and pure carbolic acid applied, a saturated solution of Condy being ordered as an injection for the mouth ; general tonics and alcohol were also presented. On the next day the outer side of the alveolus sloughed, and she died, not from septic pneumonia, which he rather feared, but either from sapræmia, or, possibly, a septicæmic condition. During the fortnight after the extraction of the tooth she would persist in having her windows absolutely closed, which might have been a predisposing cause. He mentioned the case because it seemed quite probable that the ethyl chloride destroyed the vitality of the tissues, and in an old woman of that age it might have helped to bring about the conditions he had narrated.

Mr. H. L. ALBERT said he had seen a case himself in a poor hospital patient who died exactly in the same way, except that she had septic pneumonia.

Mr. F. J. BENNETT thought it might be possible that the freezing of the gum in such an aged and infirm person might go far to lower the vitality of the tissues and render them liable to be attacked by germs.

Mr. ROUGHTON quite admitted the justice of Mr. Storer Bennett's criticisms. It was true he was not in a position to state absolutely that it was not a case of alveolar abscess. Still, the tooth he removed looked to him so much like its normal colour, and the suppuration around the tooth was so diffuse and apparently not in the immediate neighbourhood of the tooth, that he made up his mind at the time, perhaps without sufficient cause, that the tooth really had nothing to do with the suppuration. Of course he was unable to prove it.

The PRESIDENT then read his Inaugural Address, of which the following is a condensed report :—It was just 40 years since the first formal meeting of the Odontological Society, for though it was constituted in January of the previous year the first meeting was not held until 1857. During these 40 years the advance of their calling has been most marvellous ; whether we view this advance from the adaptability and improvement of their appliances or from the advance of their pathological knowledge, they saw the enormous strides that had been made. One of the most noticeable features of this period was the investigation of micro-organisms, a science now classed under the name of Bacteriology. Little did the learned Leeuwenhoeck dream, when, more than two centuries ago (1675), he recorded that he had found " viva animalculæ " in his saliva, that this, the first beginning of bacteriology, would lead a couple of centuries later to the inauguration of a new era in the treatment of disease, in which the so-called animalculæ, from being considered as curiosities, would come to be regarded as powers for good or evil of the first importance. In connection with this subject two names stood prominently above their compeers, Pasteur and Lord Lister. Pasteur's work in the investigation of fermentation first shed light on this subject. He, like Darwin, approached any subject for investigation with an open mind, searching only for truth. He demonstrated that fermentation was not a purely chemical action, but the result of the vital action of minute organisms, and also showed the important part they play in producing decomposition and putrefaction in organic matter. Further experiment showed that these organisms were not produced by spontaneous generation, but from spores or germs which are found floating in the air. This led Lord Lister to adopt the use of antiseptics in surgery, a procedure which was so well known to them all, and which would for all time be associated with his name, and had been of such inestimable benefit to suffering humanity. Their own speciality had not been behindhand in research on this subject. At the Medical Congress, in 1881 Messrs. Underwood and Mills read a paper on " Micro-organisms in Relation to Decay in Tooth Tissue." Since that time much had been done by many workers in this field. Mr. Charles Tomes, Mr. Howard Mummery, Dr. Miller, in Germany, Dr. Black in

America, and many others, have demonstrated the parts played by these organisms in producing caries. In a paper read before this Society some time since the author remarked : "If there were no micro-organisms in the mouth there would be no decay of the teeth," and he thought this proposition was generally accepted as correct. The human mouth forms quite an ideal incubator for bacteria. Here they had a moist cavity kept at a sufficiently high temperature, with ready access to the outside air ; the interspaces between the teeth, fissures in the enamel, &c., forming not only positions for their lodgment but also store-houses for particles of food, together with dead epithelial cells and mucus, on which they flourished, and which only the exercise of the greatest care in the constant use of the toothbrush could remove. Under these conditions they would expect to find a large variety of organisms in the mouth, but by a process of "survival of the fittest" the constant forms met with in the mouth were generally considered to be about six or eight. In his work on this subject Dr. Miller gave some most interesting experiments on the action of mouth bacteria on carbo-hydrates, showing that by the fermentation they produced, lactic acid was evolved, an acid which was known had a powerful solvent action on lime salts. These organisms seemed to have a dual action, first by the acid they produce removing the lime salts, and then by a peptonising action on the albuminous matrix of the softened dentine, absorbing and digesting it as food. As might be expected, the destructive action proceeds more rapidly in the direction of the dentinal tubes, along which the bacteria find their way. They produce a distension or enlargement of the tubes by the liquifaction of their walls, and often two or more of the tubes are converted into one by this process ; the softening of the dentine going on in advance of the organisms themselves. In this connection it was interesting to note that teeth affected with pyorrhœa had a remarkable immunity from caries, though the pockets of detached gum round the necks of the teeth were teeming with bacteria. Doubtless the explanation of this was that, unlike the acid fermentation of carbo-hydrates, the putrefaction from the sockets of the teeth was alkaline, and so did not act on the lime salts. The enormous increase of caries in the teeth of all civilised races during the last two or three generations was apparant to all. The question whether this was due to the food of modern life being more suitable for the growth of mouth bacteria, or that such foods and the mode of life which they called civilisation resulted in a weak quality of tooth that did not so well resist the disintegrating forces that were at work in the mouth was one that still required investigation. The researches of Mr. Charles Tomes into the composition of enamel seemed to negative the theory that the teeth of the present generation were deficient in any chemical constituent; but might they not be more defective in structure, and their constituents more loosely held together, than the teeth of our forefathers? By adopting strict Listerian principles in the treatment of septic pulps they were enabled to deal with a class of cases which years ago were a source of great trouble and uncertainty. I well remember the constant dressing of septic canals, continued sometimes over many visits, while we are now able in the majority of cases to sterilise and fill these roots at one sitting. This enables us by adopting a suitable form of crown to bring into useful service badly decayed teeth and roots which would otherwise have fallen an early prey to the forceps.

The Council was earnestly considering the question of their future habitat. Indeed, during the recess several Council meetings have been held to consider various proposals.

In conclusion, gentlemen, he would express the hope that more members would take part in the discussions. The Secretaries have the promise of some interesting papers, but there were still, he believed, some evenings to be filled up. He would also remind them of the great value of Casual Communications. Many interesting cases came before them in private practice. If they would only follow Captain Cuttle's advice: "when found make a note of," they might each contribute something to the interest and instruction of the members of their Society.

The usual votes of thanks having been passed, the Society adjourned until December 6.

LIVERPOOL DISTRICT ODONTOLOGICAL SOCIETY.

THE First Ordinary Meeting of this Session was held at the Medical Institution, Mount Pleasant, on Tuesday evening, October 19th, at 7.30 o'clock. Dr. WAITE, the President, was in the chair, and there was a good attendance of members and visitors.

The Hon. Secretary read the minutes of the last meeting, which were confirmed.

The following gentlemen were nominated for membership, six are to be balloted for at the next Ordinary Meeting, viz.:—Messrs. William Williams, Holyhead; J. E. Edwards, Wrexham; G. P. Warlow, G. B. Wilson, C. F. Anderson, Birkenhead; J. H. Anderson, A. Capper, B. Smith, S. K. Smith, S. A. Knaggs, J. W. Skae, Liverpool; and A. E. Harrison, Liscard.

Dr. WAITE gave notice that he intended to move the following as an addition to Bye-law X.:—

"That in the case of young men applying for membership within 12 months after the date of their qualification, the entrance fee of one guinea shall be remitted."

A Special General Meeting to consider the above was arranged to be held half-an-hour previous to the next Ordinary Meeting, and the Hon. Secretary was directed to send out the necessary notices.

The Hon. Secretary announced the following as the programme of the Session 1897-98:—

October 19th—Social Evening.

November 23rd—Demonstration Evening at Dental Hospital.

January 18th—Paper by W. H. Gilmour, L.D.S.Eng.

February 15th—Paper by E. J. M. Phillips, M.R.C.S., L.R.C.P., L.D.S.Eng.

March 15th—Paper by T. Mansell, L.D.S. Edin.

April 19th—Annual Meeting.

After some encouraging remarks by the President, the meeting adjourned to another room, where an excellent musical programme, contributed to a large extent by members of the Society, was gone through. During an interval a hot-pot supper was partaken of, and after more music, &c., a very pleasant evening terminated with a hearty vote of thanks to those who had contributed items.

DENTAL STUDENTS' SOCIETY, DENTAL HOSPITAL OF LONDON.

AN Ordinary General Meeting of the Society was held on Monday, October 11th, at 7.30, the PRESIDENT, Mr. C. J. Rilot, in the Chair.

Minutes of the previous meeting were read and approved.

The following new members were introduced by the Secretary to the President according to Law XIX.:—Messrs. E. F. Lane, H. Bristow, A. Rice, R. H. Heath, and G. C. Sawday.

On Casual Communications being called for—

Dr. Austen showed a polypus of the pulp in a six-year molar of a boy.

Mr. Walter brought forward a supernumerary lateral incisor.

Mr. Prideaux showed a model of a mouth in which there were two supplementary lateral incisors; also a case of gemmation of right and left upper central incisors.

Mr. Heath exhibited a case of congenital absence of both upper lateral incisors.

The President then called on Dr. Dudley Buxton for his address, entitled: "The Humours and Amenities of Anæsthetics" (by request of the author we do not publish the address).

Mr. Robins having proposed, and Dr. T. H. Miller seconded, a vote of thanks to Dr. Dudley Buxton for his highly interesting address. The meeting was brought to a close at 9.15 p.m.

An Ordinary General Meeting of the Society was held on Monday, November 15th, at 7.30 p.m., the President, Mr. C. F. Rilot, in the Chair.

On Casual Communications being called for—

Mr. Douglas Gabell showed two sections through a lower molar—the first vertical, and the second horizontal—and only going half way across the root, as far as the first section. (1) In the first section an enamel nodule was seen (cut in halves), and situated between the cementum externally and the pulp internally; above it projected into a carious cavity, and here was the pedicle of the dentine composing the of the nodule. (2) In the second section a part of the same nodule centre could be seen forming one boundary of the pulp cavity, and on the outer side at the bifurcation of the two roots, a second enamel nodule was present and projecting freely into the periosteum, and not apparently covered by cementum. This also, as is usual, was composed of an outer incomplete layer of enamel filled on with dentine, the latter being continuous with the general dentine of the tooth (these sections will be illustrated in a future number of the transactions).

Mr. W. B. **Woodhouse** exhibited (1) the model and left central incisor of the mouth of boy, aged 15, who had received a kick in the mouth from a pony ; the result of the injury was to chip a piece of enamel off the left central incisor, and force it up through the socket of the tooth, so that only the cutting edge was left visible ; the left lateral and canine, with corresponding alveolus, were smashed very much, leaving no trace of tooth substance ; the remaining teeth were uninjured ; several loose fragments of bone were removed, as well as the incisor, which was too loose and the alveolus too broken to allow of its being drawn down into position, though this treatment was tried under an anæsthetic. (2) Two large supernumerary central teeth and the model of the mouth of a boy, aged 15 ; the patient had very irregular front teeth ever since they had been cut, but no treatment had been tried ; a week ago he had noticed the supernumerary teeth appearing through the palate just behind the central incisors ; the supernumerary teeth were of very large size, and were removed with some difficulty.

Mr. L. F. **Barton** brought forward (1) the model of the lower jaw of a female, aged 24, containing five central incisors ; all five teeth were fully developed, no one tooth differing in formation from another. (2) Also the model of the upper wisdom teeth of a female, aged 40 ; each tooth was very peculiar in appearance, having a supernumerary tooth gemmated to it ; a fact which made the case still more interesting was that up to the age of 26 she had had another tooth in the place of the one which was in the left ; when this was extracted, the great tooth erupted in its place ; all the other teeth were strong and well developed.

Mr. **Prideaux** showed the model of a man, aged 23, having the right upper temporary canine and lateral retained, whilst the permanent lateral on that side had erupted posterior to the permanent canine, whilst the second bicuspid was situated high up in the alveolus and outside the first bicuspid (to be illustrated in a future number).

Mr. C. **Penfold** said that a woman came to the hospital to have a right upper lateral pivot refixed. She had worn this pivot for some time, but it eventually became loose and dropped out. When she came to the stopping room the tooth was in place: I removed the tooth, and with it came some cotton wool ; I asked her how it got there, and she told me she packed this up round the pin to hold it in position. I examined the root to see if it was in a condition to hold the pivot. In passing a bristle up, the patient gave a cry of pain, though I had not gone half way up the root; I asked her if it felt like pricking the gum, she said it did. I put the probe on the top of the root and gently shook it. The anterior part of the root was loose, while the posterior part was firm. I told the patient I didn't think it worth while to refix the pivot, and also decided to take it out. The tooth came out with the parts held together loosely; I separated them, and found that the root was split in two halves, as the specimen shows. I thought that the cotton wool must have absorbed moisture and expanded, thus causing the breaking of the tooth.

Mr. BALDWIN said: I have here a rather interesting specimen of a composite odontome, which was removed from the jaw of a man, aged 28. The history of the case is as follows:—About five weeks ago a man came into the extracting room suffering from a large and painful swelling on the right side of his face, corresponding to the region of the twelve-year-old molar. On examination the swelling was found to be quite hard, and the patient was unable to open his mouth more than about 1¼ inches. There was no history of a blow or a fall on that side of the face. On inquiry I was informed that about last Christmas he was troubled with pain, and a slight swelling on the right side of the face on the molar region. In consequence of this he went to a dispensary where they removed the carious first molar on that side. For a time he obtained relief, but after a lapse of about two months the pain and swelling recurred. He then went to Guy's Hospital, where they removed the wisdom tooth on that side. Again for a time he obtained relief, but, as before, after about two months, the pain and swelling recurred worse than ever. He was then told that they suspected the twelve-year-old molar had died, and that an abscess had formed at the apex. As he was unable to open his mouth to any extent without experiencing great pain he was given gas, and the extraction was attempted. However, to quote his own words: "When I comes to, the blankety tooth was still in my jaw, and the doctor there asweating like a horse." He was told to come again in a week's time. He went, but the tooth still defied all efforts to remove it. It then dawned upon him that he ought to obtain the very highest opinion on the subject, so, of course, at the first opportunity, he presented himself at the deservedly celebrated hospital in Leicester Square. It chanced to fall to my lot to examine him, and I noticed that the twelve-year-old molar was apparently just erupting (as the tips only of the cusps was visible), while on its distal surface, and to all appearance joined to it, was what looked like a stnmp of the wisdom tooth. On a firm downward pressure being exerted on the crown of the tooth, a very slight quantity of pus oozed up around the neck. I asked the patient if he had any objection to an attempt being made to remove it without an anæsthetic. He replied in the negative. A pair of lower molar forceps was applied, and after about five minutes, animated argumentation, the tooth became convinced of the error of its ways, and withdrew. The patient was advised to use hot fomentations frequenty inside his mouth, but about 10 days later he appeared with an abscess pointing in the cheek, opposite the anterior margin of the masseter muscle. This was opened, and a communication established externally with the socket of the tooth. The case was treated daily by syringing with 1-60 carbolic acid, and packed with iodoform gauze. The sinus has now closed entirely, except for a short distance externally. Mr. Joseph very kindly undertook the cutting of a microscopical section, which was accomplished with perfect success. Before it was cut, however, I managed to obtain a very good model in plaster of the odontome, which I have here. I am greatly indebted to Mr. Gabell for the interest he has shown in the case, and also for the immense trouble he has taken in trying to obtain a good photograph of the specimen.

Mr. HEATH related the case of dislocation, by the use of Mason's gag, of the canine and six-year-old molars in a of girl, aged 24.

In the discussion which followed :—

Mr. H. LLOYD-WILLIAMS thought he remembered having come across a similar specimen to that shown by Mr. Gabell, and promised to try and find it and show it at a future meeting.

Mr. QUINTON, mentioned a similar case to that of Mr. Prideaux and which was under Mr. Matheson's care ; it was almost an unique case, the laterals being placed behind the canines and first bicuspids.

The PRESIDENT then called on Mr. L. F. Barton to read his paper entitled "Plastic Fillings" (see page 537). A long and interesting discussion followed, during which :—

Mr. HEATH said he found a straight probe very useful for trimming off the cervical edges of interstitial amalgams.

Mr. Payne objected to the use of tin cylinders for removing the surplus mercury, as it altered the composition of the amalgam on the surface, and rendered it softer and more granular.

Mr. W. Green thought copper amalgams should not be used in permanent teeth, but only in temporary teeth.

Mr. W. B. Woodhouse advocated strongly the use of copper amalgam in wisdom teeth, but most of all in six-year-old molars and temporary teeth, except in interstitial cavities, where it was worse than useless; he was also convinced that no staining of the tooth resulted from Sullivan's amalgam, provided it was well washed before use; to get the best results, cavities should be prepared as carefully for permanent guttapercha as for gold, also, that it should be inserted in very small pieces, uniformly heated on a small steatite slab, containing a knob of fusible metal which melted at the temperature at which the guttapercha was ready for use; he thought Flagg's hard guttapercha the best; it was generally advisable to moisten the cavity before starting with eucalyptus or chloroform, and place some antiseptic—such as carbolic or oil of cloves mixed with oxide of zinc—between the dentine and the guttapercha; he did not agree with Mr. Barton that osteos wasted at the cervical margin more than elsewhere; they did this only in those cases where the cervical margin had not been kept quite dry during the setting of the cement.

Mr. Baldwin thought paraffin wax very useful to put over osteo fillings, as it became diffused through the fillings; he also advocated the use of screw-posts with amalgam for weak teeth.

Mr. T. H. Miller asked Mr. Barton what he implied by the "edge strength" of an amalgam.

Mr. H. S. Williams quoted Prof. Miller's experiments in support of the antiseptic use of copper amalgam.

Mr. H. Lloyd-Williams thought the antiseptic value of copper amalgams very slight, and remarked on the disappointment that amalgams inserted with the utmost care often gave rise to.

Mr. Stanley Colyer thought that the wasting of Sullivan's amalgams was largely due to the way it was mixed; he thought it had no antiseptic properties.

Mr. Barton having suitably replied, the meeting was then brought to a close, at 9.10 p.m,

THE DENTAL RECORD LONDON: DEC. 1, 1897.

MAGITOT AND EVANS.

THE death of Evans, of Paris, removes from our professional ranks a dentist who was remarkable in more ways than one. First he was a millionaire—we fancy he was the only dentist who ever has been so rich in worldly goods. The practice of dentistry is not one which brings great wealth to one or two, but rather affords a moderate income to many. Evans was no exception to this rule, though indirectly his practice led to the information on which he made his fortunate investments. Evans was also remarkable, through taking part in public events, in obtaining a world-wide renown. Many have had a greater reputation among their professional brethren, but it is seldom that a dentist obtains celebrity, even in his own country, and rare indeed in other lands. The practice of dentistry is a calling which leaves but little energy for work in other fields, the spare time being almost necessarily devoted to hobbies recreative in nature, whether they be in the direction of sport, of science, of art, or of literature. And in his professional life he is the quiet friend and servant of the many, rather than achieving notoriety by some brilliant service rendered to one. The obituary notices in the daily Press render superfluous any mention of the details of his life, but we believe, at any rate until recently, he worked hard at his profession, though in no need of the fees he earned; he, indeed, so it is said, was much troubled in arranging the disposition of his wealth in view of his decease. As we mentioned in our last issue, he but recently visited the States to arrange for the foundation of certain dental charities to which he proposed to leave part of his fortune. The death of Evans and of Magitot removes the two best known dentists practising in Paris. They represented two distinct types of practitioners, each in their sphere doing good work, though it is a matter for regret that neither helped in the recent educational and political movements of our French *confrères*.

News and Notes.

ERRATUM.—In Editorial of last issue Exalgin, gr. xx. should read Exalgin, gr. 2.

AT a meeting of the Eastern Counties Branch of the British Dental Association it was proposed to invite the Association to meet in Norwich in 1899. The proposal was referred to the Council for consideration.

AT the Thames Police Court, on November 11th, before Mr. Dickinson, Alfred Thomas Wilson Maguire, of 65, Bow Road, was summoned by George Read Matland, under the Dentists Act, 1878, for unlawfully taking and using the name or title of dentist. Mr. George Hay Young, who prosecuted, said the summons was taken out under the third section of the Dentists Act, which provided that from August, 1879, a person was not entitled to use the name of dentist unless registered under the Act. Therefore it would be proved that defendant was restricted from using the word "dentist," and by doing so rendered himself liable to a penalty of £20. The defendant carried on business at 65, Bow Road, and on the 25th ult. an exhibition was opened at the People's Palace, where both the complainant and defendant exhibited. The defendant had a show-case on a stall, on which was also a frame containing Press notices. Mr. Matland was struck by finding the word "dentist" in one of the notices. The complainant had a portion of the cutting, down to the word "dentist," copied. Afterwards, on going to copy the rest of the notice, he found the frame had been turned round, and on turning it round again the defendant's brother interfered. An important point was the cutting in question, which was taken from the *East London Observer*, and appeared in an issue of that paper in July, 1896, thus showing that the defendant had possession of it for some time. Probably the cutting was supplied to the newspaper by the defendant himself, and if it was not it would show that people believed he was a dentist. Afterwards the word "dentist" was erased from the cutting. It might be said that

Mr. Matland was a rival, but there could be no rivalry between a qualified and an unqualified man. The complainant, in answer to Mr. Mitchell, who defended, said that when the defendant exhibited at the exhibition last year he wrote to the People's Palace to try and get his stall removed, but the committee would not consent. Witness was registered under the Act, and a person so registered could advertise. The defendant was not on the register. In reply to the charge, Mr. Mitchell said there was no proof that the defendant was there or knew an offence had been committed, but taking the case at its strongest what did it amount to? A press-cutting, with the inspiration of which he had nothing to do. The case was entirely different to one where the man was neither qualified nor registered. Last year Mr. Maguire exhibited at the exhibition and was not interfered with. Mr. Dickinson said the defendant ought to have struck the word "dentist" out of the notice. The case had very rightly been brought before the court, but as the offence was a technical one there would only be a penalty of 1s. and 23s. costs.

THE *Dominion Dental Journal* records a death during the administration of chloroform for tooth extraction. Dr. Bell, the patient's regular physician, was summoned to administer chloroform, which anæsthetic the patient asked for. Dr. Bell made a searching examination on the bared chest of the lungs and found them, apparently, in a healthy, normal condition. He then slowly administered equal parts of chloroform, ether and alcohol. When under control, the dentist was led to remark that he had never witnessed a patient whose pulse remained so strong while anæsthetized. Dr. Bell says the patient's pulse was then at 72 and she was respiring easy. A moment later, as the dentist was preparing to operate, he noticed that her respiration became somewhat irregular and laboured. He at once began administering restoratives and sent at once for other medical assistance, Dr. V. Sullivan responding. Meanwhile the pulsation of the heart continued firmly, but respiration became more difficult. This continued for at least 10 or 12 minutes, Drs. Bell and Sullivan doing their utmost to restore consciousness. Artificial respiration was resorted to, but to no avail; the heart ceased beating and earthly means proved of no avail to induce it to resume its function. Dr. Connell on examination of the body found in the main blood vessel leading from the heart to the head, at a spot near where smaller blood vessels branch off, an aneurism, or rupture, which had allowed blood to flow into the left lung, causing death. About a pint and half of blood was found in this lung. A portion of the backbone near the spot where the rupture occurred was also found in a diseased condition, and which had been affected for some months. The affected part of the backbone had rotted away, but this would not, at its present stage, cause death. It would be impossible for a physician to detect the aneurism of the blood vessel, as it was protected from the back by the backbone, and from the front by the breast-bone, lungs, &c. A sudden strain or excitement resulting in increased action of the heart would cause this aneurism to burst, causing death. The heart was perfectly healthy, large, but not unduly so for so large a woman. The brain was also quite healthy. Some of the organs of the body showed signs of disease, but not in such an advanced state as to cause death.

In the *Journal of Mental Science*, for October, there is a paper by Dr. Edwin Goodall, describing an exact method of recording deformities of the hard palate, especially with reference to their occurrence in the insane. His object has been to obviate the need of special instruments, such, for instance, as those devised by Dr. Talbot. Briefly stated, his method is to pour into the palate of an ordinary plaster cast, to the level of the alveolar margin, a mixture of printers' composition (five parts), Keen's cement (one part), zinc oxide (one part), water (one part). When set, the portion behind the distal surface of the second molars is cut away at right angles to the alveolar margin. The mould is dipped in soluble glass and then cut in various diameters to obtain a diagram which can be compared with others of like kind. Thus, before cutting, a diagram is taken of the posterior surface and of the alveolar margin. The measurements of these diagrams are readily taken by drawing them on a paper drawn to scale. The capacity of the palate vault is easily taken by ascertaining the water displacement of the cast.

Pediatrics, quoting *Berl. Klin. Wochensch.*, 1897, xxxiv., 19, says:—"Mirror speech, 'la parole en miroir,' analogous to mirror-writing, is the name given by Marcotte to a symptom observed by him in a girl 12 years of age suffering from abscess of the brain following an otitis. The patient was trephined when in a condition seemingly *in extremis*, after which operation speech again gradually returned, at first in perfectly unintelligible sentences; for example, the child said: 'Le—quille—trans—ser—lais—me—vous—lez—vou—te—tan—ma,' &c. It was only after the patient was asked to write it down, that it was discovered that the syllables, and even long sentences, were pronounced in an inverse order, in such a manner that the phrases written above meant: 'Ma tante, voulez-vous me laisser tranquille.' This disturbance of speech persisted for five weeks. Eventually the child fully recovered."

WRITING on the evil effects of smoking in the young, *Pediatrics* says:—"There is a humourous side to the question of children smoking. In a book on tobacco lately published is the following paragraph: 'It was the custom in England about the middle of the seventeenth century, for children going to school to carry in their satchel with their books a pipe of tobacco, which their mother took care to fill early in the morning, it serving them in place of breakfast. At the accustomed hour every one laid aside his book to light his pipe, the master smoking with them and teaching them how to hold their pipes and draw in the tobacco.' At the present day Dutch children smoke pipes, and little boys of five and seven years old calmly discuss these calumets of peace as they proceed to school. Still this does not alter the fact that smoking injures the health of the young. The excessive use of tobacco is harmful to many adults; it tends to deteriorate the moral character in the same way as the inordinate use of chloral or bromide of potassium will deprave the mind, by lowering the tone of certain of the nerve centres."

GLANCING over the pages of the RECORD for the purpose of making an index, we have been chiefly impressed by the number of deaths during dental operations which have occurred in the past year. It is probable that others have escaped our notice, or may not have been published, but, as it stands, the list is sufficiently dismal, Thus, we find we have recorded nine deaths after extraction of teeth, though one of these happened last year in Philadelphia following the administration of nitrous oxide gas. Of the remaining eight four happened during or after the administration of chloroform for dental purposes, in two instances no anæsthetic at all was used ; in one nitrous oxide followed by ether was administered ; and in the last fatality, which happened in Germany, bromide of ethyl was employed. It is surely a fact to be remembered that, though the death rate is increased beyond the average by the two cases due probably to cardiac failure, even in the absence of depressing anæsthetic agents, and by one happening during the use of gas and ether, yet chloroform remains responsible for 50 per cent. of the deaths.

Abstracts and Selections.

THE ROLE OF THE DENTISTS IN THE IDENTIFICATION OF THE VICTIMS OF THE CATASTROPHE OF THE "BAZAR DE LA CHARITE," PARIS, 4th of May, 1897.

By Dr. Oscar Amoedo.

Professor at the Ecole Odontotechnique de Paris.

On the 4th of May, 1897, Paris was the scene of a terrible catastrophe, in which 126 persons met their death and more than 200 were more or less seriously wounded.

The Charity Bazaar, at which the greatest ladies of France gave their services for the benefit of the poor, was reduced to ashes in less than 10 minutes.

This bazaar had been held every year since 1885 in different buildings. This year it was installed on some waste ground situated in the Rue Jean Goujon, in a rectangular shed of varnished wood, 72 meters long and 20 meters wide. The roof was made of tarred cardboard.

The interior was a *facsimile* representation of a street of old Paris, which was so much admired at the Theatre and Music Exhibition. Each side of the street was bordered by the stalls of the saleswomen, These stalls were of wood, covered with canvas painted to represent the shops of the Middle Ages. It was at these stalls that the lady patronesses sold artistic trifles and works of art for the benefit of charitable institutions, &c. The sellers were recruited from the members of the highest Parisian society, that this charity *fête* had attracted in such immense numbers.

A cinematograph had been installed in the long gallery, almost in front of the exit. This was the cause of the catastrophe. The construction of the building and the contents offering no resistance, the whole bazaar was liable to become a prey to the flames at any minute.

The Apostolic Nuncio came about half-past three to give the pontifical blessing to all present, and at twenty minutes past four, when the crowd was greatest, composed almost entirely of ladies pressing round the stalls, flames were seen darting out from where the cinematograph was situated. In an instant, owing to the cumbustible character of the roofing and the decorative panels, everything was in a blaze and a fearful panic ensued.

The unfortunate women, half mad with fear, made a rush for the doors, but the means of exit were too few and too narrow, and, falling one on to the other, many perished from suffocation before being burned.

Help arrived promptly, but the violence of the flames was such that in less than 10 minutes the roof and walls fell in, burying more than 100 victims.

I will not describe the fearful picture that the "Bazar de la Charité" presented at this moment, the horrible cries of the unfortunates burned alive, nor the scenes, terrifying and sublime, of which this was the arena. These facts are fresh in the memory of all.

Nothing could be done except to inundate the burning beams and proceed to clear the ruins. One hundred and twenty-six corpses were transported into a hall of the Palais de l'Industrie, which was near, and it was there on the following days that the relatives of the victims came to recognise the bodies of their friends.

Recognition was not always easy.

The hall to which the bodies had been transported presented a terrifying aspect. The corpses, all horribly mutilated, carbonised, shapeless, a great number entirely nude, had been placed side by side upon planks. Some had lost their arms, others had had a leg completely calcined ; all bore upon their faces an expression of fearful terror. Many had the cranium entirely denuded and the integuments of the face blackened and hardened by the fire. The skin of the abdomen had burst from the intense heat, allowing the intestines of the unhappy victims to fall out. In one corner lay shoes, and arms and legs detached from their trunks.

Over all that the torches of the *gardiens de la paix*—it was nine o'clock at night—threw their lugubrious light and filled the hall with smoke. It was a sickening mixture of the odours of resin, phenol, petroleum, and burnt flesh.

A witness of the scene has given us the following graphic description :—

" What a terrible nightmare ! Knees broken open as by an axe, arms bent over the head in the attitude of superhuman despair ; children's boots—shoes torn from delicate insteps—bodies, as of negroes, opened as after a butchery by anthropophagi ; blackened legs, some bent like vine-shoots, some keeping the roundness of their shapes, and the heads, carbonized, shrunk, reduced to nothing, or at least only the teeth remained ! "

The following morning an anxious crowd waited, and the search began. The recognition proceeded rapidly, and towards midday only 30 corpses remained. But these were so frightfully mutilated, the fire had so disfigured and reduced them, destroying the last means of recognising them, that nobody expected the identity of any of them to be established by any one.

But, however, there remained there numerous bodies, and relatives in tears went round looking for some indication which would permit recognition. But in vain. Everything had been destroyed, the bodies blackened, without arms, the legs half carbonized, the heads half calcined, and faces so contracted as to be unrecognisable. Neither clothes, shoes, nor jewellery remained ; nothing to give any clue whatever.

It was then that M. Albert Hans, the Paraguay Consul conceived the idea of calling the dentists who had given their services to the victims. His counsel was followed, and with excellent results. In the face of the powerlessness of the legal doctors, since all ordinary signs of identification had disappeared, our *confrères* were appealed to.

These latter were Drs. Burt, Brault, Davenport, Ducourneau Godon, and some others.

But their task was not an easy one. On the one hand, the integuments of the faces which had been able to resist the fire had been blackened and become as hard as leather. The greater part of the victims had succumbed with the mouth closed and the teeth clenched ; the tissues were set, the muscles contracted, and it was impossible to open either jaws or cheeks to make the slightest examination. On the other hand, out of respect for the unfortunate victims and their unhappy relatives who were present, the magistrates had forbidden any section of the cheek. M. Ducourneau alone was permitted to practice it for the recognition that he had to attempt.

Happily our distinguished *confrères* were in possession of an absolutely certain means of identification. In fact, they all possessed very exact charts of the mouths of their respective patients, and, furnished with these documents, they asserted their power to recognise their clients. One, for instance, had inserted amalgam stoppings, another gold fillings, a third had put in some pivot teeth and extracted others. Every one of them, in fact, possessed the knowledge of such particularities as would allow them, on examination, to decide one way or the other.

The examinations were made, and, beyond the happy results obtained by way of identification, they permitted our *confrères* to make some useful observations. They were able to ascertain how many gums in general had been protected from the fire by the hardening of the cheeks. One of them told me that he had found some of the mucous membranes pink and almost in a normal state.

Thanks to their assistance, many of the victims were given back to their families. They were, in the first place, the Duchesse d'Alençon, the Vicomtesse de Beauchamp, Madame Nitot, Mademoiselle Barassé, Madame de Villeneuve, Madame Jauffred, and others.

From my *confrères* I obtained much information as to the precise results obtained by these examinations, and I am in possession of numerous documents and the greater part of the registers that they used. These I am keeping for a work I have in preparation.

I only wish to draw your attention to the importance of these facts and to their future value. The importance of identification is patent to every one. You know the situation, in the eye of the law, of a family whose head has disappeared without such disappearance being officially registered. This is briefly how the affair is regarded in France. In the matter of absence the civil code distinguishes three periods ; by absence is understood any doubt cast on the existence of a person.

First. *Presumption of absence.*—This period begins as soon as doubts are raised as to the existence of the absent one.

Second. *Declaration of absence.*—This is made by a judgment, which cannot be given until five years have elapsed since the disappearance or since the past news.

Third. *Definite possession* cannot be obtained till after 30 years after judgment has been given declaring the absence, or 100 years from the birth of the person absent.

Let us examine the position of the family during these three periods.

During the first period the property of the absent person is badly cared for ; the heirs-presumptive have no rights in it, and may not even administer it ; they can at the most have a curator appointed by the courts, and this curator, not being controlled, is frequently careless in his office. During these four years they are not allowed to touch any part of the revenue.

During the second period—Declaration of absence. When four years have elapsed since news was had of the absent person, a judgment of the *Tribunal de la Ière Instance* having declared the absence, those interested may have themselves placed in provisional possession of the property of the absent person. This permission obtained, the will, if one exists, is opened, and the heirs, beneficiaries, or others having lesser rights can enter provisionally into possession, under caution. They can and ought to take any capital due to the absent one, make necessary repairs, lease his property, and place his capital. They cannot alienate or mortgage his property, nor accept nor repudiate any succession which would have devolved on him. They enjoy the revenue of the absent one, but not entirely. If he reappears before 15 years from the day of his disappearance they must return to him a fifth of his revenue ; after 15 years the tenth ; after 30 years the revenues belong to them.

During the third period. The absence has continued 30 years since the entry into provisional possession. Now the beneficiaries may demand the division of the property and obtain the entry into definite possession by the *Tribunal de la Ière Instance.* They become the owners of the property; they can sell or mortgage it. But if the absent one return, they are held to deliver to him all the said property they still possess and the profit obtained from the sale of any part of it.

I trust you will excuse this rather long legal dissertation. But here the facts speak for themselves, and are worth more than any commentary.

The situation, then, of the families is thus terrible; a fortune, more or less considerable, is completely idle during a certain time, and those who have only that resource find themselves in an extremely embarrassing position. The attention of public bodies and that of the medico-legal profession cannot be too strongly drawn to this point, and the humane and social importance of identification cannot be doubted by any one.

Thus it has appeared in an absolute manner, and that not only in the catastrophe of the Bazar de la Charité, but in still other circumstances, and we need only state the case of the Prince Imperial, son of Napoleon III., and that of the Marquis de Morès, not to speak of more celebrated ones, it has appeared, I say, that in this sort of examination the dentist has had an important part to play. And this part in the catastrophe with which we are now occupied had only commenced to be employed when all other means of identification had failed, the dentists of the victims being the only ones able to identify them. Besides, it was quite by chance that our *confrères* were appealed to. It was, as we said, on the advice of the Consul of Paraguay.

The servants of the unfortunate victims and those who had been used to be with them were first heard. Influenced by the greatest willingness, these persons could only afford scanty information in the present case. They came hurriedly forward, in tears, half mad with fright at the sight of the horrible scene. And what means of recognition did they possess? Stuffs, pieces of clothing, things entirely trivial and of little importance, several ladies might have the same dressmakers and wear the same materials.

With these means fatal mistakes might and did take place. It was thus on the opinion of a domestic that one took away a body that was thought to be that of Madame J. Haussmann. It was transported to the domicile of the deceased, placed in a *chapelle ardente*, and surrounded by the whole family in tears. Suddenly it was discovered that an error had been made. The body of Mademoiselle Dutreil had been taken for that of Madame Haussmann.

Later I had occasion to see Madame Haussmann's dentist, and he showed me the register containing the details of operations he had performed. Their character was such as to leave no doubt that he would have been able to establish the identity if he had been called.

It is useless to insist on the consequences of such errors. I should not have done so if these sad events had not been fruitful with lessons for the future.

It is certain that a body on which are still preserved the clothes worn during life may by them be recognised, though the certainty is not very great. But when nothing is left but blackened rags, one ought, it seems, to show more reserve in having recourse to such indications of recognition.

And why wait for a counsel given by chance to call the dentists of the victim ?

It is evident that if, for the purposes of recognition, one takes into account the stuffs, jewels, the proofs of a servant, the documents that the dentist can dispose of are of quite another value. In fact, the teeth are the parts of an individual that last longest after all other signs have disappeared. They have a considerable value from the point of view of identification, and the knowledge that the dentist possesses of the dental system of his client, with the register that he keeps, are means of recognition that one ought not to neglect.

It would thus be desirable that an expert dentist should be named to examine the subject. In that way the identification would be complete, and in many cases this would be the only manner of establishing it.

The sad event of which Paris was the scene must be a lesson for the future. And we dentists have the right to persist in our demand upon the public authorities that the part we are able to play in identifications should not be forgotten, and, above all, that it shall not be placed after others which at first sight, though they appear simple, are certainly less scientific.

Too many interests are involved in these questions to allow of them being, through carelessness, neglected. Security given to families, the means of livelihood assured, the utilization of a fortune that absence has rendered completely unproductive, and, finally, the certainty of being able to avoid the cruel mistakes just referred to, these are, it seems to me, strong enough arguments from the double point of view, the humane and the social.

And beside, the question is not new, and numerous writers have drawn attention to it. I will only mention the most important. They are those of MM. Dumur, Montfort, Merciolle, Mela, Platschick, Godon, &c.

At the time of the fire at the Opéra Comique, in 1887, M. Godon published in *Odontologie* an important memoir on the question, and finished by making a demand upon the public authorities.

Still more recently, two months before the fire at the Bazar de la Charité, there appeared in the *Dental Cosmos* an article by Dr. Alton Howard Thompson, of Kansas, entitled "Identification by means of Teeth." This writer is astonished, first of all, that in anthropometric examinations there is no mention made of the teeth. Given the typical character of the teeth, and the difference between the operations that may be made on them, he concludes that the chance is very small that the same case should occur twice. Consequently the teeth would be of undeniable utility in establishing identity.

He reminds us also that in many cases the payment of life insurance has been contested because means of identification were wanting. He also gives us a plan of measuring the dental arcades and the arch of the palate, and advises us to note what operations have been performed on the teeth and the most minute peculiarities they present.

In the same month that the catastrophe occurred, Dr. E. K. Wedelstaedt published in the *Dental Cosmos* "A System of Measurement of Teeth." In the course of this article, the first that has appeared on this interesting question, he is surprised at the results of these measurements. In more than a hundred sets of teeth that he examined he declares that he has never found two central or lateral incisors exactly alike. In the same mouth the measurement of two corresponding teeth has shown the difference of tenths of millimeters. From this he concludes the importance of the teeth in respect to the identification of dead bodies. He even remarks that before long life insurance companies will have the teeth of their clients examined and a chart made of their dental system.

Such was the state of the question at the time of the fire in the Rue Jean Goujon. You know what useful work our *confrères*, who were called in were able to accomplish and what a number of identifications they were able to make.

We must now complete the work that has been begun. We must insist, as M. Godon did 10 years ago, *that in necessary cases an expert dentist shall be named for the examination of the dental system.*

But the question is of still wider signification, and it is certain that from the point of view of life insurance it will assume greater proportions. In the near future the companies will require an examination of the teeth to be made by a skilful dentist, which, joined to the health certificate, will complete a document which under certain circumstances may be the only means of recognition.

In further extension of this scheme we may add that for soldiers and criminals this mode of examination furnishes most useful data, and will allow deserters or guilty persons to be recognised more readily than by physical particularities, which are necessarily susceptible of change.

The anthropometrical department, which has been so cleverly organised by Mr. Bertillon, would gain by the addition to the register of each criminal of a special plan marking the condition of the dental system. This register, filled up by an expert dentist, would be of the greatest value. In case of doubt arising as to an individuality, a reference made to the mouth plan would settle the question immediately.

It often happens that the body of an individual is found far from the district in which he lived. The identity might, therefore, have to be settled at any time and at any place. Here arises the important question of an international understanding as to dental nomenclature.

In the case of a body being found in conditions like those of the Marquis de Morès, it is evident that the dentist could not travel any considerable distance to examine the body which he believes to be that of his client. It is therefore necessary that the charts taken by any dentist should be understood by all the dental confraternity. These desirable results can only be obtained when a uniform nomenclature is adopted by the dentists of all countries.

Again, the dentist may disappear, but his books and business remain, and he has a successor. It is necessary that the latter shall be able to continue his practice, and in that case it is necessary, also, to have a uniform nomenclature. It is then indispensable that this understanding should be brought about. A congress like this one, composed of the representatives of all countries of the world, ought to undertake the task of establishing this universal nomenclature.—*Cosmos.*

TREATMENT OF SOMNILOQUY.

By Charles Nevitte Gibbons, D.D.S., New Orleans, La.

Ten months ago a middle-aged gentleman presented himself, complaining of a trouble for which, at first I was not very hopeful of finding a remedy. He was a somniloquist, and during his sleep he was a nuisance to all of his family, keeping them awake with his loud and constant jabbering. He was a sensitive gentleman, of refined disposition, and it was a source of great mortification to him to know that he made himself thus objectionable to all about him.

Upon examination, I found that he had lost both lower sixth year molars, thus leaving spaces which I utilised in the following manner :—

I took an impression of the lower arch and tongue with an impression tray specially devised for this case. Next I made gold crowns to cover the twelfth-year molars, on each of which I soldered a flange or extension along the anterior approximal surface. These crowns were permanently cemented over the natural teeth. I then made of vulcanite rubber a thin plate accurately fitting and resting upon the palatal surfaces of all the anterior teeth, and having projections which would extend between the bicuspids and molars on each side.

In use it was placed in position in the mouth with the extensions at each side passing under the flanges on the crowns. Any effort on the part of the patient to raise the tongue is prevented by the fact that the flanges on the crowns stop the plate from lifting at the posterior part, whilst the anterior part is further supported by resting on the anterior teeth.

The plate was fitted over the tongue so that that organ has sufficient room for comfort, and there is abundant space for the action of the muscles in deglutition; otherwise the fixture could not be tolerated. This is worn with comfort and is not displaced during the night.

The gentleman does not talk in his sleep any more, and he, as well as his family, are well pleased with the result.—*Items.*

DENTAL WAX.—Take of French chalk, 14 parts; gum kauri, 8 parts; and stearine, 4 parts. Melt the stearine on a water bath, then add the finely powdered gum kauri in small quantities. When dissolved, sift in slowly the French chalk, and stir constantly till cold. The composition can be coloured with carmine if desired.—*Review.*

Reviews.

"THE AMERICAN TEXT-BOOK OF OPERATIVE DENTISTRY," in contributions by eminent authorities. Edited by EDWARD C. KIRK, D.D.S. Illustrated with 751 Engravings. London: Henry Kimpton.

The title of this work does not fully express its scope. It is more than a treatise on operative work, for a large portion of most of the chapters is devoted to anatomical and pathological facts; two, indeed, deal entirely with the former subject. We mention this because in reviewing the work we are compelled to explain the omission of pathological data by the fact that this is not a treatise on dental surgery but only on operative dentistry; on the other hand, valuable as many of the introductory remarks may be, we scarcely expect to find them set out at such length in a book bearing the above-mentioned title. Chapters I. and II., dealing respectively with "Macroscopic Anatomy of the Human Teeth" and "The Embryology and Histology of the Dental Tissues," are well written and interesting, though we question the wisdom of their inclusion in this work, the more so as Chapter II. deals almost entirely with the development of teeth and but little with the histology of the formed organ. We admit, indeed, who would deny? that these subjects "are fundamental to a proper understanding of operative methods," as the Editor contends, in his introductory remarks, but we would prefer that he should have given them to us in another text-book, where they would be fully and completely treated.

In Chapter I., written by Alton Howard Thompson, we should like to criticise the use of such contradictory terms as "round square" and "round v" as applied to forms of dental arch, especially as other and better terms are in use. It is also, it seems to us, inexpedient to speak of the "cone theory" as an accepted dogma till it is established as a proved fact.

In Chapter II., by R. R. Andrews, we note that the old description is retained of the development of the permanent from the neck of the enamel organ of the temporary tooth germ. Röse's models are mentioned, and we should have been glad to have had the author's opinion on Röse's description of the early stages of tooth development.

Chapters III. and IV., by Louis Jack, deal with the examination, cleansing and separation of teeth. He advises the mixture of glycerine with pumice for cleansing teeth, to be followed by glycerine and stannic oxide (putty powder). An account of the use of tooth powders and washes might well have been included.

Chapter V., by the same writer, concerns the "Treatment of Hypersensitive Dentine." This is a very useful chapter, and contains a valuable account of Electrical Osmosis, and of the principles on which this is based.

In Chapter VI.. S. H. Guilford writes on the Preparation of Cavities, and in Chapter VII. we have good teaching, by Louis Jack, on the "Exclusion of Moisture"; but we should have liked this subject more fully treated, for instance, little or nothing is said about clamps for cervical cavities or of other means of using rubber in such cases.

Chapter VIII., by the same writer, on the "Selection of Filling Materials" is useful; we notice, however, the questionable statement that "During the pregnant state . . . . the teeth lose their resistant power, which may later be restored." Surely far too dogmatic for an unproved and possibly untrue observation.

Chapter IX., on "Fillings with respect to Contour," by S. H. Guilford, is short and well written.

Chapter X., on "Filling Cavities with Metallic Foils," by Edwin T. Darley. The writer is obviously unfamiliar with the hard rolled gold cylinders used here for non-cohesive work. The teaching is orthodox and moderately full. Hand pressure for cohesive work does not receive attention, though it has undoubted advantages in certain cases.

Chapter XI., on the "Properties, &c., of Plastics," by Henry H. Burghard, is eminently useful, and the same may also be said of the following chapter on "Combination Fillings." Chapter XIII., on "Inlays," by Wm. E. Christensen, is good as far as it goes, but does not include the important improvements which have been made by Dall, Howard, and others in this country.

Louis Jack handles the subject of "Conservative Treatment of the Dental Pulp" in an able manner in the following chapter. Even though there be no lymphatics in the pulp we cannot see that this necessarily "deprives the pulp of the power to remove inflammatory effusions"; indeed, if this were so, "pulp capping" would be probably impossible. Indeed the observation made on page 311 that calcific deposits in the pulp chamber "are liable to resorption on the occurrence of irritation of the pulp" distinctly shows the vessels of the pulp, like any others, to possess the power of removing inflammatory products. We cannot agree that in filling over accidental exposures "a metal filling is better in these cases, since the slight thermal irritation tends to the ultimate recovery." Rest, not continued irritation, is needed for repair, and we are glad to find on a later page (305), speaking of the same thing, the writer says: "It is generally best to delay permanent closure by a conductor of heat until after an experience of a year or more with a non-conducting stopping. At the end of this time the filling may be nearly all removed," &c. Why coagulating the surface of the pulp should be said to prepare the tissue to absorb arsenic we cannot understand, and if it be correct that this "markedly lessens the time of absorption," the explanation is surely not true.

Chapter XV., on "The Treatment and Filling of Root Canals," by Henry H. Burchard, is one of the best in the book, and is well worthy of careful study. But why is "diagnosed" elongated into the cacophonic word "diagnosticated." Chapter XVI., on "Dento-Alveolar Abscess," is by the same writer. The statement that "children having a family history of syphilis and tuberculosis frequently exhibit evidences of lack of vital resistance" may be compared with that of Jonathan Hutchinson: "The suggestion that such maladies as scrofula . . . . . have their origin in hereditary syphilis is, I believe, a baseless and improbable supposition." We confess to feeling that, unless under exceptional circumstances, the worst cases of alveolar abscess would be better treated by removal of the tooth, and we may compare in this connection the statement made by J. D. Thomas in Chapter XIX.: "In cases of severe abscess where extraction is indicated, necrosis of the process invariably accompanies to a greater or less extent, and such a condition will require careful treatment. Sometimes the pulps of the adjoining teeth will be destroyed if the inflammation has extended beyond the limits of the original abscessed tooth; this must also be carefully watched. These conditions appear much more frequently than formerly, as a consequence of the system of prolonged treatment of pulpless teeth with chronic abscesses, which has been followed for some years. Frequently this necrotic condition involves the alveolar plates extending over the surfaces of two or three adjoining teeth." We notice here, and in other chapters in the book, a tendency to mention medical compounds by their names and not to give their composition; thus, on page 388 we find recommended Lugol's solution (liquid iodi compositus, grs. xx. to the ounce). Iodi compositus is not in the British Pharmacopœia, and we would gladly know its composition.

Chapter XVII., by C. N. Peirce, is on "Pyorrhæ Alveolaris," is chiefly pathological not operative dentistry, but is an interesting statement of the case from the writer's standpoint.

Chapter XVIII., by Edward C. Kirk, on "Discoloured Teeth and Their Treatment," is of exceptional value, and one of the few chapters which confine themselves to matters in harmony with the title of the book.

We have read better articles on "Extraction of Teeth" than given in Chapter XIX., by M. H. Cryer and J. D. Thomas. It contains a large section on the surgical anatomy of the bones and teeth which is good. There are many advantages in reading a book written by various authors, but for a learner there are compensating disadvantages as may be seen by the following parallel quotations (the italics are ours) :—

CRYER.	THOMAS.
Page 482.—The forceps should grasp as much of the roots as possible, avoiding pressure upon the crown, and being *careful not to force the beaks between the alveolar plates*, as this would result in *breaking one or both plates*, etc.	Page 513.—When extracting, for example, a lower tooth, and it is necessary to *force the beaks of the forceps well down through the process*, etc.
Page 497.—(*re* Hæmorrhage) . . . . many using Monsel's solution of persulphate of iron, which, although it may be a good styptic for use in other parts of the body, *should not be used in the mouth.*	Page 517.— . . . . and immediately apply a drop of Monsel's solution on a pledget of cotton upon the spot from whence the blood comes, packing it well into the socket, and holding it firmly with the fingers for a few minutes.
Page 447.—(*re Forceps*) The inner surface of each beak should be concave in a transverse section and *without serrations, as these are of no assistance, but tend to weaken the beak, and are difficult to clean.*	Page 513.— . . . . with with beaks serrated. Page 514.—With forceps having beaks that are not serrated, teeth having conical tapering roots will prevent the perfect fitting of the cutting edge ; these will sometimes slip through the posterior opening of the upper and lower alveolar pairs with great force. The writer has seen, in one instance, a tooth slip through the beaks of an unserrated pair of forceps and break a pane of glass in front of the chair, and an under single root which shot up with sufficient velocity to penetrate the soft palate.

Henry H. Bulchard writes the section of this chapter on "Local Anæsthetics." He would limit the dose of cocaine to $\frac{1}{8}$ gr. for hypodermic, or, as he says, "hypodermatic use."

The following chapter is a concise account of the operation of "Plantation of Teeth," by Louis Ottofy.

Chapter XXI., on the "Management of Deciduous Teeth," is by Clark L. Goddard, and as is the next chapter on "Orthodontia," whilst an interesting chapter by Calvin C. Case on "The Development of Esthetic Facial Contours" concludes the book.

The printing, etc., are as good as can be desired, and the binding smart, though apparently not over strong. We commend this book to English readers as one well worthy of perusal, and feel sure it will become what it has been prematurely called, "*The American* Textbook of Operative Dentistry.

CORRESPONDENCE.

[We do not hold ourselves responsible in any way for the opinions expressed by our correspondents.]

THE MEDICAL TREATMENT OF TOOTHACHE—A DANGEROUS MISQUOTATION.

To the Editor of the "DENTAL RECORD."

SIR,—Reviewers are proverbially careless readers, and the gentleman who honoured my paper with his notice was no exception to the rule or he would not have represented me as recommending a dose of gr. xx. of exalgin. The dose I really advised was gr. ij. Very serious symptoms have followed the administration of gr. vj. I hope, therefore, that you will give great prominence to this correction, lest any of your readers should make a very dangerous experiment in therapeutics.

One more point—your reviewer says: "Alcohol, so often useful, Dr. Coley regards as even more objectionable than narcotics." The tone of superior wisdom in this sentence amused me; but I suppose it is the prescriptive right of all reviewers to assume that tone. Nevertheless, I hope your readers will take my warning against the avoidable use of *alcohol and all other narcotics.* A large part of the purpose of my paper was to show that, *when it was necessary to relieve toothache by means other than surgical* it could usually be done quickly and effectually, by remedies safer and less objectionable than morphia or alcohol. I do not deny that alcohol is often successful in relieving pain. But a physician has larger opportunities than a dental surgeon of observing the evil results which often follow the prescription of alcohol or any other narcotic.

May I be forgiven if I say that in regard to some other points your reviewer would have written a little less if he had known a great deal more?

I am, &c.,
FREDERIC C. COLEY, M.D.

[We are obliged to Dr. Coley for pointing out the serious misprint. We certainly did not refer to alcohol in narcotic doses, nor did we advise its use. We merely mentioned an experience with which Dr. Coley's is apparently in harmony. We are glad Dr. Coley admits "a tone of superior wisdom to be the prescriptive right of all reviewers"; but the last sentence of his letter would suggest that they err, if it be an error, in good company.—ED.].

THE LATE DR. EVANS (OF PARIS), AND NITROUS OXIDE GAS.

To the Editor of the "DENTAL RECORD."

SIR,—Reference is made in the Obituaries of Dr. Evans to his great philanthropy. In connection with this, it may be well, therefore, to remind the Dental Profession that in 1869 Dr. Evans brought over to this country and exhibited at the Dental Hospital of London, and to the Odontological Society a bronze flask containing Nitrous Oxide Gas, compressed into a liquid, which, until then, had only been supplied to the profession in the bulky compressed form, and it was in great measure due to Dr. Evans' persistent energy brought to bear upon us, that the commercial supply of Liquid Nitrous Oxide Gas became an accomplished fact in 1870.

Dr. Evans ordered repeatedly from us large quantities of this Liquid Gas for the Paris Ambulance for Surgical operations during the Franco-German war, and the supply was only eventually stopped by the investment of Paris by the German Army.

Thinking this may interest the profession,

We remain,
Yours truly,
S. COXETER & SON.

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